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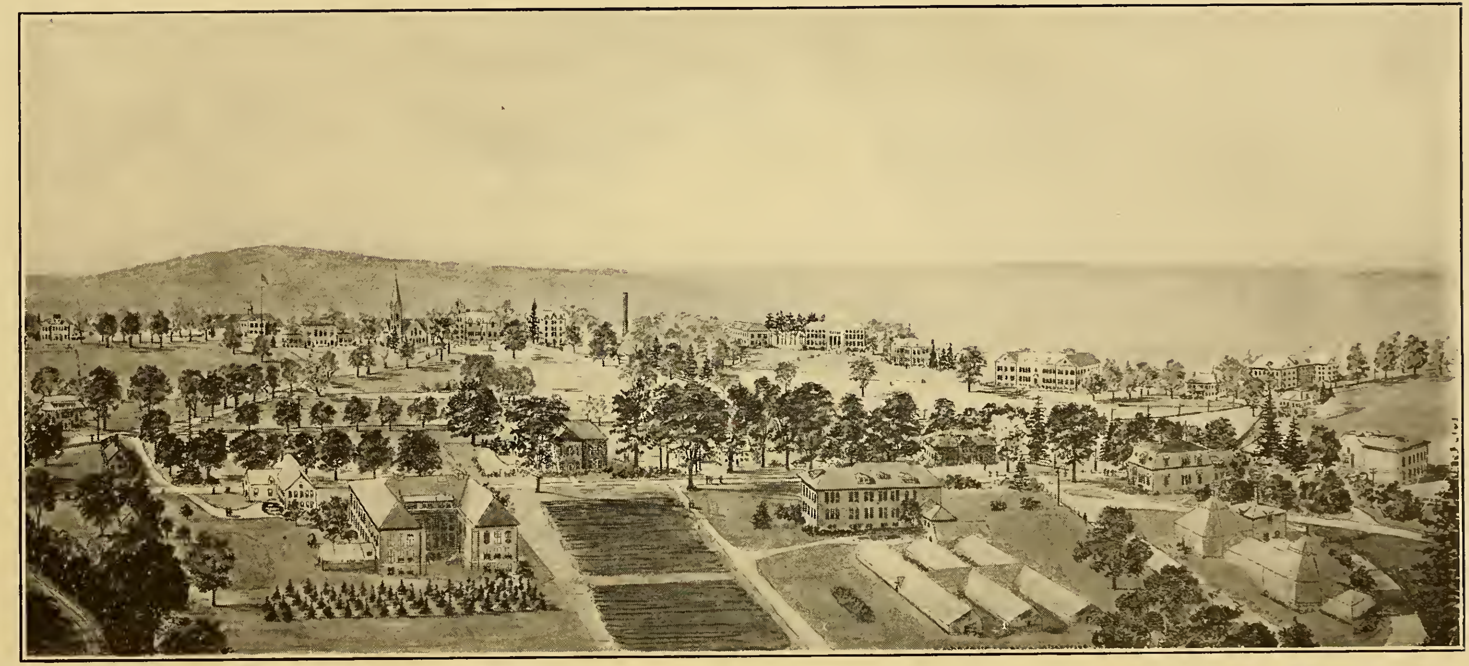
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Botany
Physics
Microbiology
Entomology, Zoölogy and Geology
Floriculture, Vegetable Gardening and Forestry

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AMHERST, MASSACHUSETTS

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THE SIXTY-FIFTH ANNUAL REPORT OF THE MASSACHUSETTS AGRICULTURAL COLLEGE

PART II.—CATALOGUE OF THE COLLEGE FOR 1927-1928

Publication of this Document approved by the Commission on Administration and Finance

6M-9-'27 No. 83

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LEGISLATION PERTAINING TO THE COLLEGE.

Without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life. — *Act of Congress, July 2, 1862.*

THE COLLEGE CHARTER. — "The leading object of the college shall be to teach subjects relating to agriculture and the mechanic arts, so as to promote liberal and practical education. Its curriculum may include other scientific and classical studies and shall include military tactics." — *From Chapter 75 of the General Laws of Massachusetts.*

This issue of the catalogue represents the status of the college for the current college year, with provisional announcement of courses of study and other matters for the year to follow. When deemed necessary, additional announcements are made in a supplementary bulletin, published in the spring.

The college reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

CALENDAR.

1927-1928.

1927.

September 12, Monday	Fall term begins for Freshmen
September 14, Wednesday	Fall term begins for all except Freshmen
October 12, Wednesday	Holiday, Columbus Day
November 23–28, Wednesday, 12 M.–Monday, 8.00 A.M.	Thanksgiving Recess
December 17, Saturday, 12 M.	Fall term ends

1928.

January 3, Tuesday, 8.00 A.M.	Winter term begins
February 22, Wednesday	Holiday, Washington's Birthday
March 17, Saturday, 12 M.	Winter term ends
March 26, Monday, 8.00 A.M.	Spring term begins
April 19, Thursday	Holiday, Patriot's Day
May 30, Wednesday	Holiday, Observance of Memorial Day
June 8–11, Friday–Monday	Commencement
June 14–16, Thursday–Saturday	Entrance Examinations
September 5–8, Wednesday–Saturday	Entrance Examinations
September 10, Monday	Fall term begins for Freshmen
September 12, Wednesday	Fall term begins for all except Freshmen
October 12, Friday	Holiday, Columbus Day
November 28–December 3, Wednesday, 12 M.–Monday, 8.00 A.M.	Thanksgiving Recess
December 15, Saturday, 12 M.	Fall term ends

1929.

January 2, Wednesday, 8.00 A.M.	Winter term begins

THE TRUSTEES.

Organization of 1927.

MEMBERS OF THE BOARD.

	TERM EXPIRES
ARTHUR G. POLLARD of Lowell	1927
GEORGE H. ELLIS of West Newton	1927
JOHN CHANDLER of Sterling Junction	1928
ATHERTON CLARK of Newton	1928
NATHANIEL I. BOWDITCH of Framingham	1929
WILLIAM WHEELER of Concord	1929
SARAH LOUISE ARNOLD of Lincoln	1930
JAMES F. BACON of Boston	1930
FRANK GERRETT of Greenfield	1931
HAROLD L. FROST of Arlington	1931
CHARLES H. PRESTON of Danvers	1932
CARLTON D. RICHARDSON of West Brookfield	1932
DAVIS R. DEWEY of Cambridge	1933
JOHN F. GANNON of Pittsfield	1933

MEMBERS EX OFFICIO.

His Excellency Governor ALVAN T. FULLER of Boston, *President of the Board of Trustees.*
ROSCOE W. THATCHER, *President of the College.*
PAYSON SMITH, *State Commissioner of Education.*
ARTHUR W. GILBERT, *State Commissioner of Agriculture.*

OFFICERS OF THE TRUSTEES.

His Excellency Governor ALVAN T. FULLER of Boston, *President.*
WILLIAM WHEELER of Concord, *Vice-President.*
ROBERT D. HAWLEY of Amherst, *Secretary.*
FRED C. KENNEY of Amherst, *Treasurer.*
FRANK GERRETT of Greenfield, *Auditor.*

STANDING COMMITTEES OF THE TRUSTEES.[1]

Committee on Finance.

ATHERTON CLARK, *Chairman.*
GEORGE H. ELLIS.
NATHANIEL I. BOWDITCH.
WILLIAM WHEELER.
ARTHUR G. POLLARD.
CARLTON D. RICHARDSON.

Committee on Course of Study and Faculty.

WILLIAM WHEELER, *Chairman.*
JAMES F. BACON.
PAYSON SMITH.
DAVIS R. DEWEY.
JOHN F. GANNON.
ARTHUR W. GILBERT.
MISS SARAH LOUISE ARNOLD.

---

[1] The President of the College is ex-officio member of each committee.

Committee on Farm.

Nathaniel I. Bowditch, *Chairman.*
Frank Gerrett.
George H. Ellis.
Arthur W. Gilbert.
Carlton D. Richardson.

Committee on Horticulture.

Harold L. Frost, *Chairman.*
Charles H. Preston.
John Chandler.
Atherton Clark.

Committee on Experiment Department.

Charles H. Preston, *Chairman.*
Arthur W. Gilbert.
John Chandler.
Arthur G. Pollard.
Harold L. Frost.
Carlton D. Richardson.
Miss Sarah Louise Arnold.

Committee on Buildings and Arrangement of Grounds.

George H. Ellis, *Chairman.*
Frank Gerrett.
William Wheeler.
James F. Bacon.
Charles H. Preston.
Atherton Clark.

Committee on Extension Service.

John Chandler, *Chairman.*
Nathaniel I. Bowditch.
George H. Ellis.
Harold L. Frost.
Davis R. Dewey.
John F. Gannon.
Arthur W. Gilbert.
Miss Sarah Louise Arnold.

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George H. Ellis, *Chairman.*
Payson Smith.
Nathaniel I. Bowditch.
William Wheeler.
Carlton D. Richardson.
James F. Bacon.
Arthur W. Gilbert.

OFFICERS OF THE INSTITUTION.

As of November 1, 1927.

Officers of Administration.

Roscoe W. Thatcher, D.Agr., LL.D. . . . . President's House.
President.

William L. Machmer, A.M. . . . . 25 Amity Street.
Dean.

Fred C. Kenney . . . . Mount Pleasant.
Treasurer.

Henry T. Fernald, Ph.D. . . . . 44 Amity Street.
Director of the Graduate School.

Sidney B. Haskell, B.S. . . . . 2 Mount Pleasant.
Director of the Experiment Station.

Roland H. Verbeck, B.S. . . . . 14 Orchard Street.
Director of Short Courses.

Willard A. Munson, B.S. . . . . . . 101 Butterfield Terrace.
Director of the Extension Service.

Robert D. Hawley, B.S. . . . . South Amherst.
Secretary.

Basil B. Wood, A.B. . . . . Amity Street.
Librarian.

William I. Goodwin, B.S . . . . North Amherst.
Field Agent.

The Faculty of Instruction.

(The names of the faculty are arranged in groups according to rank and in sequence according to seniority of service in the institution.)

PROFESSORS.

Roscoe W. Thatcher, D.Agr., LL.D. . . . . President's House.
President.

Joseph B. Lindsey, Ph.D. . . . . 47 Lincoln Avenue.
Goessmann Professor of Agricultural Chemistry and Head of Department.

John E. Ostrander, A.M., C.E. . . . . . . 33 North Prospect Street.
Professor of Mathematics and Head of Department.

Henry T. Fernald, Ph.D. . . . . 44 Amity Street.
Professor of Entomology and Head of Department.

Frank A. Waugh, M.Sc. . . . . Campus.
Professor of Landscape Gardening, Head of Department, Head of Division of Horticulture.

A. Vincent Osmun, M.Sc. . . . . 16 Northampton Road.
Professor of Botany and Head of Department.

Clarence E. Gordon, Ph.D. . . . . 38 Lincoln Avenue.
Professor of Zoölogy and Geology, Head of Department, Head of Division of Science.

Fred C. Sears, M.Sc. . . . . Mount Pleasant.
Professor of Pomology and Head of Department.

James A. Foord, M.Sc.Agr. . . . . 54 Lincoln Avenue.
Professor of Farm Management and Head of Department.

Alexander A. Mackimmie, A.M. . . . . North Amherst.
Professor of Economics and Sociology, Head of Department, Head of Division of Humanities.

Alexander E. Cance, Ph.D. . . . . 9 Fearing Street.
Professor of Agricultural Economics and Head of Department.

Joseph S. Chamberlain, Ph.D. . . . . Mount Pleasant.
Professor of Organic and Agricultural Chemistry.

John C. Graham, B.S.Agr. . . . . 68 Lincoln Avenue.
Professor of Poultry Husbandry and Head of Department.

G. Chester Crampton, Ph.D. . . . . Fernald Hall.
Professor of Insect Morphology.

Charles A. Peters, Ph.D. . . . . Sunset Place.
Professor of Inorganic and Soil Chemistry.

George E. Gage, Ph.D. . . . . The Davenport.
Professor of Bacteriology and Physiology and Head of Department.

William L. Machmer, A.M. . . . . 25 Amity Street.
Dean of the College and Professor of Mathematics.

Arthur N. Julian, A.B. . . . . 4 Farview Way.
Professor of German.

Curry S. Hicks, B.Pd., M.Ed. . . . . Sunset Avenue.
Professor of Physical Education and Hygiene and Head of Department.

Walter W. Chenoweth, M.Sc. . . . . North Amherst.
Professor of Horticultural Manufactures and Head of Department.

Harold M. Gore, B.S. . . . . Plainville Road.
Professor of Physical Education.

Christian I. Gunness, B.S. . . . . 105 Butterfield Terrace.
Professor of Agricultural Engineering and Head of Department.

Charles H. Thompson, M.Sc. . . . . Mount Pleasant.
Professor of Horticulture.

Charles H. Patterson, A.M. . . . . 26 Lincoln Avenue.
Professor of English and Head of Department of Languages and Literature.

John B. Lentz, A.B., V.M.D. . . . . 3 Dana Street.
Professor of Veterinary Science and Head of Department.

Arthur B. Beaumont, Ph.D. . . . . 51 Amity Street.
Professor of Agronomy and Head of Department.

Ralph A. Van Meter, B.S. . . . . 7 East Pleasant Street.
Professor of Pomology.

Edna L. Skinner, M.Ed. . . . . Fearing Street.
Professor of Home Economics, Head of Department, Adviser of Women.

Winthrop S. Welles, B.S. . . . . 23 Lincoln Avenue.
Professor of Agricultural Education and Head of Department.

Clark L. Thayer, B.S. . . . . North Amherst.
Professor of Floriculture and Head of Department.

Sidney B. Haskell, B.S. . . . . 2 Mount Pleasant.
Acting Head of the Division of Agriculture.

Laurence R. Grose, A.B., M.F. . . . . 32 Amity Street.
Professor of Forestry and Head of Department.

William C. Sanctuary, B.S. . . . . 11 Cottage Street.
Professor of Poultry Husbandry.

Harry N. Glick, Ph.D. . . . . 27 Fearing Street.
Professor of Agricultural Education.

Wallace F. Powers, Ph.D. . . . . 7 Allen Street.
Professor of Physics and Head of Department.

N. Butler Briscoe, Major, Cavalry, U. S. A. . . . . . 2 Allen Street.
Professor of Military Science and Tactics and Head of Department.

Julius H. Frandsen, M.S.A. . . . . 35 Lincoln Avenue.
Professor of Animal and Dairy Husbandry and Head of Department.

—— ——
Professor of Rural Sociology and Head of Department.

ASSISTANT PROFESSORS.

FREDERICK A. McLAUGHLIN, B.S. Assistant Professor of Botany.	4 Nutting Avenue.
ARTHUR K. HARRISON Assistant Professor of Landscape Gardening.	26 Fearing Street.
WALTER E. PRINCE, A.M. Assistant Professor of English.	27 Amity Street.
LAWRENCE S. DICKINSON, B.S. Assistant Professor of Horticulture.	2 Farview Way.
PAUL SEREX, Ph.D. Assistant Professor of Chemistry.	Lincoln Avenue.
ORTON L. CLARK, B.S. Assistant Professor of Botany.	12 College Street.
FRANK PRENTICE RAND, A.M. Assistant Professor of English.	3 Mount Pleasant.
VICTOR A. RICE, M.Agr. Assistant Professor of Animal Husbandry.	35 Woodside Avenue.
LUTHER BANTA, B.S. Assistant Professor of Poultry Husbandry.	Sunset Avenue.
FRANK C. MOORE, A.B. Assistant Professor of Mathematics.	10 Allen Street.
ENOS J. MONTAGUE, B.S. Assistant Professor of Farm Practice.	Campus.
BROOKS D. DRAIN, S.M. Assistant Professor of Pomology.	17 Fearing Street.
RAY E. TORREY, Ph.D. Assistant Professor of Botany.	Inwood.
GUY V. GLATFELTER, M.S. Assistant Professor of Animal Husbandry.	29 Northampton Road.
GEORGE W. ALDERMAN, B.A. Assistant Professor of Physics.	Tillson Court.
MARSHALL O. LANPHEAR, M.Sc. Assistant Dean and Assistant Professor in charge of Freshman Agriculture.	Mount Pleasant.
WILLIAM H. DAVIS, Ph.D. Assistant Professor of Botany.	12 Nutting Avenue.
CHARLES P. ALEXANDER, Ph.D. Assistant Professor of Entomology.	120 Pleasant Street.
GRANT B. SNYDER, B.S.Agr. Assistant Professor of Vegetable Gardening.	50 Pleasant Street.
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HUBERT W. YOUNT, M.Sc. Assistant Professor of Agricultural Economics.	39 Main Street.
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MINER J. MARKUSON, B.S. Assistant Professor of Agricultural Engineering.	1 Kendrick Place.
LEON A. BRADLEY, Ph.D. Assistant Professor of Bacteriology.	North Amherst.
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MARION L. TUCKER, M.A. Assistant Professor of Home Economics.	6 Nutting Avenue.
MILES H. CUBBON, Ph.D. Assistant Professor of Agronomy.	14 Nutting Avenue.
ROLLIN H. BARRETT, M.S. Assistant Professor of Farm Management.	4 Chestnut Street.
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Assistant Professor of Military Science and Tactics.
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Agricultural Counsellor for Women.
Emory E. Grayson, B.S. . . . . 37 Cottage Street.
Supervisor of Placement Training.

Instructors.

George F. Pushee . . . . North Amherst.
Instructor in Agricultural Engineering.
Mrs. Curry S. Hicks, B.A. . . . . Sunset Avenue.
Instructor in Physical Education.
John B. Newlon . . . . North Amherst.
Instructor in Agricultural Engineering.
Charles H. Thayer . . . . South East Street.
Instructor in Agronomy.
Arthur P. French, M.Sc. . . . . South Amherst.
Instructor in Pomology.
Mary E. M. Garvey, B.S. . . . . 29 South Prospect Street.
Instructor in Physiology.
Llewellyn L. Derby . . . . Oneacre.
Instructor in Physical Education.
Harold W. Smart, A.B., LL.B. . . . . 50 Pleasant Street.
Instructor in Farm Law, Business English and Public Speaking.
Marion G. Pulley, B.S. . . . . 70 Lincoln Avenue.
Instructor in Poultry Husbandry.
Lorin E. Ball, B.S. . . . . 3 Allen Street.
Instructor in Physical Education.
Mary J. Foley, M.S. . . . . 3 South Prospect Street.
Instructor in Agricultural Economics.
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Instructor in Pomology.
James E. Fuller, A.M.[1]
Instructor in Bacteriology.
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Instructor in Zoölogy.
Oliver W. Kelly, B.S. . . . . 22 Cottage Street.
Instructor in Agronomy.
Harold D. Boutelle, B.S., Ch.E. . . . . . . 19 Woodside Avenue.
Instructor in Mathematics.
Gerald J. Stout, M.S. . . . . Inwood.
Instructor in Vegetable Gardening.
L. Leland Durkee, B.S. . . . . 44 Sunset Avenue.
Instructor in German.
Clayton L. Farrar, B.S. . . . . 8 Hallock Street.
Instructor in Entomology and Beekeeping.
Delmont T. Dunbar, A.B., Licenciado en Literatura . 86 Pleasant Street.
Instructor in French.
Calton O. Cartwright, B.Voc.Agri. . . . . Northampton.
Instructor in Horticultural Manufactures.
Paul B. Anderson, M.A. . . . . 53 Lincoln Avenue.
Instructor in English.

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[1] Absent on leave.

Lawrence E. Briggs, B.S. Instructor in Physical Education.	3 Allen Street.
Wilbie S. Hinegardner, Ph.D. Instructor in Chemistry.	16 Nutting Avenue.
Kenneth A. Salman, B.S. Instructor in Entomology.	84 Pleasant Street.
Stowell C. Goding, A.M. Instructor in French.	3 McClellan Street.
Carroll A. Towne, B.S. Instructor in Horticulture.	19 Main Street.
Harry G. Lindquist, M.S. Instructor in Dairying.	66 Pleasant Street.
Ransom C. Packard, B.S.A. Instructor in Bacteriology.	North Amherst.
——— ——— Instructor in Animal Husbandry.	

The Experiment Station Staff.

Administrative Officers.

Roscoe W. Thatcher, D.Agr., LL.D. President.	President's House.
Sidney B. Haskell, B.S. Director.	2 Mount Pleasant.
Joseph B. Lindsey, Ph.D. Vice Director.	47 Lincoln Avenue.
Edwin F. Gaskill, B.S. Assistant to the Director.	North Pleasant Street.

Professors.

Edward B. Holland, Ph.D. Research Professor of Chemistry.	28 North Prospect Street.
John E. Ostrander, A.M., C.E. Meteorologist.	33 North Prospect Street.
Henry T. Fernald, Ph.D. Professor of Entomology and Head of Department.	44 Amity Street.
A. Vincent Osmun, M.Sc. Professor of Botany and Head of Department.	16 Northampton Road.
Jacob K. Shaw, Ph.D. Research Professor of Pomology.	5 Farview Way.
Henry J. Franklin, Ph.D. Research Professor in charge of Cranberry Station.	East Wareham.
Fred W. Morse, M.Sc. Research Professor of Chemistry.	40 Pleasant Street.
Frank A. Hays, Ph.D. Research Professor of Poultry Husbandry.	Oneacre.
William L. Doran, M.Sc. Research Professor of Botany.	16 Nutting Avenue.
John P. Jones, Ph.D. Research Professor of Agronomy.	8 Allen Street.

Assistant Professors.

Arthur I. Bourne, B.A. Assistant Research Professor of Entomology.	12 East Pleasant Street.
Carleton P. Jones, M.Sc. Assistant Research Professor of Chemistry.	8 Nutting Avenue.
John G. Archibald, M.Sc. Assistant Research Professor of Chemistry.	North Amherst.
John S. Bailey, M.Sc. Assistant Research Professor of Pomology.	7 Phillips Street.

Victor A. Tiedjens, M.Sc. . . . . Waltham.
Assistant Research Professor of Vegetable Gardening.
Emil F. Guba, Ph.D. . . . . Waltham.
Assistant Research Professor of Botany.
Warren D. Whitcomb, B.S. . . . . Waltham.
Assistant Research Professor of Entomology.
Leon A. Bradley, Ph.D. . . . . North Amherst.
Assistant Research Professor of Bacteriology.

Other Experiment Station Officers.

Harry L. Allen . . . . 89 Main Street.
Laboratory Assistant in Chemistry.
James R. Alcock . . . . North Amherst.
Laboratory Assistant in Animal Nutrition.
F. Ethel Felton, B.A. . . . . The Davenport.
Editorial Assistant.
Alyn S. Ball . . . . 94 Main Street.
Laboratory Assistant in Botany.
Ruby Sanborn, A.B. . . . . 25 Fearing Street.
Investigator in Poultry Husbandry.
Gladys I. Miner . . . . 87 Pleasant Street.
Curator, Department of Botany.
Walter L. Cutler . . . . North Pleasant Street.
Laboratory Assistant in Pomology.
Paul R. Nelson, M.S. . . . . The Davenport.
Investigator in Chemistry.
Joseph L. Kelley . . . . East Wareham.
Investigator in Cranberry Studies.
Moses E. Snell . . . . Brooks' Farm.
Investigator in Agronomy.

Research Staff employed on Purnell Funds.

Carl R. Fellers, Ph.D. . . . . 33 East Pleasant Street.
Research Professor of Horticultural Manufactures.
Lorian P. Jefferson, M.A. . . . . The Davenport.
Assistant Research Professor of Agricultural Economics.
Norman J. Pyle, V.M.D. . . . . 16 North Prospect Street.
Assistant Research Professor of Avian Pathology.
Linus H. Jones, Ph.D. . . . . 1 Allen Street.
Assistant Research Professor of Botany.
Esther S. Davies, Ph.B. . . . . Lincoln Block.
Assistant Research Professor of Home Economics.
Ronald L. Mighell, M.S. . . . . Inwood.
Investigator in Farm Management.
Francis P. Griffiths, B.S. . . . . Flint Laboratory.
Investigator in Horticultural Manufactures.
Ruth E. Sherburne, B.S. . . . . 87 Pleasant Street.
Laboratory Assistant in Agricultural Economics.
Marian V. Brown, A.B. . . . . 87 Pleasant Street.
Laboratory Assistant in Farm Management.
Virginia R. Dufresne, A.B. . . . . Draper Hall.
Laboratory Assistant in Agricultural Economics.
Elsie E. Nickerson, B.S. . . . . 3 South Prospect Street.
Technical Assistant in Home Economics.
——— ———
Assistant Research Professor of Agricultural Economics.
——— ———
Assistant Research Professor of Dairying.

Control Service Staff.

Henri D. Haskins, B.S. Official Chemist, Fertilizer Control.	Easthampton.
Philip H. Smith, M.Sc. Official Chemist, Feed Control.	102 Main Street.
William R. Hinshaw, M.S., D.V.M. Specialist, Poultry Disease Elimination.	10½ Kellogg Avenue.
H. Robert DeRose, M.S. Assistant Official Chemist, Fertilizer Control.	19 Phillips Street.
Ellmore F. Sanders, D.V.M. Assistant Specialist, Poultry Disease Elimination.	21 Pleasant Street.
James T. Howard Inspector.	7 Phillips Street.
Marvin W. Goodwin, B.S. Analyst.	North Pleasant Street.
Clifton B. Waite Field Agent, Disease Control.	Orange.
John W. Kuzmeski, B.S. Analyst.	Leverett.
Miriam K. Clarke, A.B. Analyst.	Draper Hall.
Elizabeth F. Hopkins, M.S. Analyst.	87 Pleasant Street.

Extension Service Staff.

ADMINISTRATIVE OFFICERS.

Roscoe W. Thatcher, D.Agr., LL.D. President.	President's House.
Willard A. Munson, B.S. Director.	101 Butterfield Terrace.
Ralph W. Redman, B.S. Assistant Director.	6 Nutting Avenue.
George L. Farley, M.Sc. State Leader of County Club Agents.	61 Amity Street.
Sumner R. Parker, B.S. State Leader of County Agricultural Agents.	South Amherst.
Mrs. Annette T. Herr, A.M. State Leader of County Home Demonstration Agents.	25 Fearing Street.
William F. Howe Assistant State Leader of County Club Agents.	North Amherst.
Earle H. Nodine, B.S. Assistant State Leader in charge of Poultry Clubs.	21 Woodside Avenue.
Marion E. Forbes Assistant State Leader of County Club Agents.	7 Nutting Avenue.
Earle S. Carpenter, M.Sc. Supervisor, Exhibits and Extension Courses.	33 Fearing Street.
Grunow O. Oleson, M.Sc. Extension Editor.	41 Lincoln Avenue.

SPECIALISTS.

William P. B. Lockwood, M.Sc. Extension Professor of Dairying.	51 Cornhill, Boston.
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William R. Cole Extension Professor of Horticultural Manufactures.	33 Fearing Street.
Clifford J. Fawcett, B.S. Extension Professor of Animal Husbandry.	70 Lincoln Avenue.

Fayette H. Branch, B.S. . . . . 31 East Pleasant Street.
Extension Professor of Farm Management.
Ray M. Koon, M.Sc. . . . . Waltham.
Extension Professor of Vegetable Gardening; in charge of Market Garden Field Station, Waltham.
John P. Helyar, M.Sc. . . . . 21 Pleasant Street.
Extension Professor of Agronomy.
Harold B. Rowe, B.S. . . . . 5 Allen Street.
Extension Specialist in Agricultural Economics.
Wilbur H. Thies, M.Sc. . . . . 16 Nutting Avenue.
Assistant Extension Professor of Pomology.
May E. Foley, M.A. . . . . 6 Nutting Avenue.
Assistant Extension Professor of Nutrition.
Esther B. Cooley, B.S. . . . . Sunderland.
Assistant Extension Professor of Home Economics.
Mrs. Harriet J. Haynes, B.S. . . . . 7 Nutting Avenue.
Assistant Extension Professor of Home Economics.

Agents in Counties.

Bertram Tomlinson . . . . South Yarmouth.
Agricultural Agent.
Mary G. Flint, B.S. . . . . Barnstable.
Home Demonstration Agent.
Ella M. Buckler, B.S. . . . . Hyannis.
Club Agent.
Harry J. Talmage, B.S. . . . . Pittsfield.
Agricultural Agent.
Miriam J. Cox . . . . Pittsfield.
Home Demonstration Agent.
Nellie E. Clogston, B.S. . . . . Pittsfield.
Club Agent.
Warren L. Ide, B.S. . . . . Segreganset.
Agricultural Agent.
Flora M. Miller, B.S. . . . . Segreganset.
Home Demonstration Agent.
Edwin R. Wyeth, B.A.S. . . . . Segreganset.
Club Agent.
Francis C. Smith, B.S. . . . . Danvers.
Agricultural Agent.
Marion P. Crawford . . . . Danvers.
Home Demonstration Agent.
Robert B. Ewing . . . . Middleton.
Club Agent.
Joseph H. Putnam, B.S. . . . . Greenfield.
Agricultural Agent.
Vera Smith, B.S. . . . . Greenfield.
Home Demonstration Agent.
Paul E. Alger, B.S. . . . . Greenfield.
Club Agent.
Wilbur T. Locke, B.S. . . . . Springfield.
Agricultural Agent.
Mrs. Lillian M. S. Chase . . . . Springfield.
Home Demonstration Agent.
Otis E. Hall, A.B. . . . . West Springfield.
Club Agent.
Allen S. Leland, B.S. . . . . Northampton.
Agricultural Agent.
Mary Pozzi . . . . Northampton.
Home Demonstration Agent.

Harold W. Eastman Club Agent.	Northampton.
Allister F. MacDougall, B.S. Agricultural Agent.	Lexington.
Regina M. Feeney, B.S. Home Demonstration Agent.	Waltham.
George E. Erickson, B.S. Club Agent.	Waltham.
Earl M. Ricker, B.S. Agricultural Agent.	Walpole.
Eunice S. Clark, B.S. Home Demonstration Agent.	Walpole.
Willard G. Patton Club Agent.	Walpole.
Gardner C. Norcross, B.S. Agricultural Agent.	Brockton.
Mary S. Dean Home Demonstration Agent.	Brockton.
Stanley L. Freeman, B.S. Club Agent.	West Bridgewater.
George F. E. Story, B.S. Agricultural Agent.	Worcester.
Mildred C. Thomas Home Demonstration Agent.	Worcester.
Harley A. Leland, B.S.Agr. Club Agent.	Shrewsbury.

The Library Staff.

Basil B. Wood, A.B. Librarian.	Amity Street.
Lena V. Chapman Assistant in charge of circulation.	3 Kendrick Place.
Mrs. Nan L. Kelly Library Assistant.	22 Cottage Street.
Katherine Powell Department Librarian.	6 Phillips Street.
Bessie M. Weymouth Cataloguer.	116 Pleasant Street.

Other Officers.

Baldassaros E. A. Bovenzi Engineer.	4 Chestnut Street.
John K. Broadfoot Assistant Treasurer.	130 Pleasant Street.
Frank T. Canavan Superintendent of Dairy Manufactures.	60 Pleasant Street.
Avis P. Christopher Resident Nurse.	Infirmary.
Lawrence S. Dickinson, B.S. Superintendent of Grounds.	2 Farview Way.
Grace E. Gallond Assistant to the Dean.	28 Pleasant Street.
Mrs. Cora W. Hathaway Manager of the Dining Hall.	Draper Hall.
S. Church Hubbard Foreman, Department of Floriculture.	North Amherst.
Clarence A. Jewett Superintendent of Buildings.	112 Pleasant Street.
Joseph Kuzmeski Technical Assistant, Department of Bacteriology.	Leverett.

John J. Lee . . . . 38 Cottage Street.
Assistant to the Military Detail.
Mrs. Mary Macrae . . . . Infirmary.
Matron.
Mrs. Marie B. Marsh . . . . Abigail Adams House.
Matron.
William E. Martin . . . . 5 Phillips Street.
Laboratory Assistant, Department of Horticultural Manufactures.
Enos J. Montague, B.S. . . . . Campus.
Farm Superintendent.
Walter E. Webster . . . . 99 Main Street.
Curator, Goessmann Laboratory.

Graduate Assistants.

Frank J. H. Boden, B.S. . . . . 29 North Prospect Street
Department of Chemistry.
Charles F. Clagg, B.S. . . . . 3 Allen Street.
Department of Entomology.
Malcolm Dull, A.B. . . . . 35 North Prospect Street.
Department of Chemistry.
Richard W. Fessenden, B.S. . . . . 90 Pleasant Street.
Department of Chemistry.
Ralph L. France, B.S. . . . . 9 Fearing Street.
Department of Bacteriology and Physiology.
Loyal R. Johnson, B.S. . . . . 17 Amity Street.
Department of Landscape Gardening.
James C. Kakavas, B.S. . . . . 45 Main Street.
Department of Bacteriology and Physiology.
Harold R. Knudsen, B.S. . . . . Tillson Court.
Department of Agronomy.
George J. Larsinos, B.S. . . . . 17 North College.
Department of Agronomy.
Majel M. MacMasters, B.S. . . . . 28 Pleasant Street.
Department of Chemistry.
Donald A. Pettee, B.S. . . . . 42 Lincoln Avenue.
Alvord Fellow in Dairying.
Allen H. Reid, B.S. . . . . 9 Fearing Street.
Department of Landscape Gardening.

Department of Agricultural Economics.

STANDING COMMITTEES.

1927-1928.

Committees of the General Staff.

Economic Status of Massachusetts Agriculture.

Asst. Professor YOUNT.
President THATCHER.
Director HASKELL.
Director MUNSON.
Professor BRANCH.
Asst. Professor MIGHELL.
Mr. ROWE.

Exhibits and Publicity.

Secretary HAWLEY.
Professor COLE.
Asst. Professor MONTAGUE.
Mr. CARPENTER.
Mr. GOODWIN.
Mr. OLESON.
Mr. DERBY.

Library.

Professor CANCE.
Professor PATTERSON.
Professor BEAUMONT.
Asst. Professor CUTLER.
Mr. WOOD.

Massachusetts Agricultural Review.

Director HASKELL.
Director MUNSON.
Director VERBECK.
Secretary HAWLEY.
Professor VAN METER.
Asst. Professor YOUNT.
Asst. Professor GLATFELTER.
Asst. Professor KNOWLTON.
Mr. OLESON.

Publications.

Director HASKELL.
Director MUNSON.
Director FERNALD.
Secretary HAWLEY.
Mr. OLESON.

Committees of the Faculty.

Commencement.

Asst. Professor CLARK.
Treasurer KENNEY.
Secretary HAWLEY.
Professor CHAMBERLAIN.
Professor GROSE.
Asst. Professor TUCKER.
Mr. S. R. PARKER.

Course of Study.

President THATCHER.
Dean MACHMER.
Director HASKELL.
Director VERBECK.
Professor WAUGH.
Professor GORDON.
Professor WELLES.
Professor OSMUN.
Professor BEAUMONT.
Professor PATTERSON.
Professor CANCE.
Professor SKINNER.
Professor VAN METER.

Entrance Examination and Admission.

Dean MACHMER.
Asst. DEAN LANPHEAR.
Professor POWERS.
Professor OSMUN.
Professor GLICK.
Professor JULIAN.
Asst. Professor CUBBON.

Scholarship.

Dean MACHMER.
Asst. Dean LANPHEAR.
Professor PETERS.
Professor HICKS.
Professor MACKIMMIE.
Asst. Professor RAND.
Asst. Professor TORREY.
Asst. Professor RICE.
Asst. Professor ALEXANDER.

Discipline.

Professor MACKIMMIE.
 Dean MACHMER
 Professor GORE.
 Professor GUNNESS.
 Asst. Professor HARRISON.
 Mrs. HICKS.

Employment.

Professor THOMPSON.
 Treasurer KENNEY.
 Secretary HAWLEY.
 Professor FRANDSEN.
 Mr. GRAYSON.
 Miss HAMLIN.

Student Life.

Professor THAYER.
 Professor SEARS.
 Professor HICKS.
 Professor SANCTUARY.
 Asst. Professor KNOWLTON.
 Mr. SALMAN.

Health and Housing.

Professor GAGE.
 Treasurer KENNEY.
 Director VERBECK.
 Professor LENTZ.
 Professor SKINNER.
 Professor HICKS.

Academic Activities Board.

Dean MACHMER.
 Asst. Dean LANPHEAR.

Athletic Board.

Dean MACHMER.
 Professor OSMUN.
 Mr. DUNBAR.

FACTS ABOUT THE COLLEGE.

HISTORICAL SKETCH.

One of the outstanding achievements of the middle of the nineteenth century was the remarkable development in the field of science. This, in turn, brought about great changes in industry, transportation and agriculture and stimulated the desire for new information and further training. People were enthusiastic about the possibilities of the future. It is not surprising, therefore, that scientific courses gradually found their way into the academies and colleges. This was not without opposition from the friends of the old classical training, however. In many instances institutions founded along literary and philosophical lines did not favor the introduction of courses based on the needs of students desiring to perfect themselves in the technical principles and practice of the arts and industry. The demand for such courses increased, nevertheless. It was evident that the old order of education was changing but at the time the new was not apparent. It was under the above conditions that the Massachusetts Agricultural College had its birth.

THE MORRILL ACT.

This demand for technical education finally crystallized into a bill known as the Morrill Act of 1862, endowing colleges for this purpose in every state of the Union. The original bill was framed by Senator Justin L. Morrill of Vermont and its final enactment obtained under his leadership. It provided that public land be assigned to the several states and territories, the funds from the sale of which were to be used to establish and maintain colleges of agriculture and mechanic arts. Although the main objective of such colleges was training in Agriculture and Mechanic Arts, they were to include other scientific and classical subjects in order to promote both the liberal and practical education of the industrial classes.

Massachusetts accepted the provisions of the Morrill Act in 1863 and immediately began to plan for a new college. The Massachusetts Institute of Technology was already organized, however, so it was decided that instruction in mechanic arts should be given there. For this reason the college, when founded, was one of agriculture only and today has the unique distinction of being the only separate agricultural college in the country. The General Court required that $75,000 be raised and presented to the Trustees by that town in which the college was to be located. Northampton, Lexington, Springfield and Amherst offered to comply with this request. After much discussion, Amherst was finally selected as the location and a tract of land containing 310 acres purchased for the college.

FOUNDING AND EARLY GROWTH OF THE COLLEGE.

The institution was formally opened to students October 2, 1867. At that time there were four teachers on the faculty and four wooden buildings on the campus. The number of students steadily increased during the first term and by December 47 had been admitted. Of these members of the pioneer class of 1871, twelve are still alive. These men have seen the whole development of education in scientific agriculture for at the time of their entrance into the college, technical training in this field was merely an idea, not yet even in the experimental stage. From this rather modest beginning, the college has grown steadily, not only in the field of resident instruction, but in that of research and in extension. In a sense, experimental work is as old as the institution, for during its earliest years some very important investigations were carried on by the instructors. Research work was established as a separate unit, however, in 1882 when the state provided for the establishment of an agricultural experiment station. This station which was located at the college, was supplemented in 1887 by another, the Hatch Experiment Station, provided for under the Act of Congress establishing an experiment station in connection with agricultural colleges. These two stations were combined in 1895 and are now known as the Massachusetts Agricultural Experiment Station.

The scope of the college was further broadened with the establishment of the Extension Service. This aimed to make available to residents of Massachusetts useful and practical information in agriculture and home economics. It now serves those who are unable to take resident instruction in Amherst.

Present Scope of the College.

Thus at the present, the college fulfills the three-fold purpose of instruction, research, and extension work.

The resident instruction in agriculture covers this field in its broadest sense. It includes not only training in the various types of farming, dairying, animal husbandry, farm management, poultry husbandry, floriculture, pomology and vegetable gardening, but also in the sciences underlying the great agricultural industry. Thus a student if he chooses, may specialize in chemistry, botany, entomology, microbiology, zoölogy or pathology, among the physical and natural sciences or in economics, sociology and education among the social sciences. Landscape gardening opens still another field. In addition the curriculum is so planned as to include enough of the classical studies to train a man liberally as well as vocationally.

For those who have neither the preparation, the time or desire to pursue a collegiate course leading to a degree, there are provided certain non-collegiate courses in practical agriculture. These include a two-year course, a winter school course and a vocational poultry course. Resident instruction in all courses is available for both men and women.

In addition to this resident teaching there is the research work which attempts to accumulate new information in the broad field of agriculture and home economics. This information in turn is disseminated about the state to those unable to receive it through resident instruction, through the medium of the Extension Service.

THE COLLEGE CAMPUS.

Hand in hand with this steady growth of the College, there has come a marked expansion in physical equipment. The original farm of 1867, with its run down fields and degenerated apple orchards cut up here and there by old Virginia rail fences and hedge rows has metamorphosed during the last fifty years into one of the most attractive college campuses in New England. A brief statement of land, buildings and equipment supplemented by a panorama of the campus today will show to what extent the original four wooden buildings have been outgrown.

Location and Lands.

The Agricultural College is located in Amherst, a town of about six thousand people, overlooking one of the most picturesque sections of the Connecticut Valley. From the standpoint of teaching material in the field of science and agriculture, the location is ideal. Amherst is ninety-seven miles from Boston and may be reached by the Central Massachusetts division of the Boston & Maine Railroad, or by the Central Vermont Railroad. Electric cars also connect the town with Northampton, Holyoke, and Springfield. The campus consists of a tract of approximately seven hundred acres, lying about a mile north of the village center. In addition the college owns another area of seven hundred and fifty-five acres located about six miles north of the campus on Mount Toby. This is used for a demonstration forest.

Buildings and Equipment.

The campus is laid out in the form of an oval attractively set off by the college pond in the center. Around this oval are grouped the main buildings of the college. The order of these buildings, beginning at South College, is indicated on the campus panorama shown by frontispiece.

South College. — Here are located the administrative offices, including the office of the President, Dean, Treasurer, Secretary, the Extension Service, Short Courses, and Women's adviser. The department of Agricultural Economics also has offices here. The west wing is used as a men's dormitory. This accommodates about twenty students. Erected 1885.

North College. — This is a men's dormitory which accommodates about thirty-five students. In addition there are the offices of the Christian Association and the Inter-Church Student Secretary, together with a large Social Union room used for meetings and entertainments. This is one of the oldest buildings on the campus, having been erected in 1867.

Flint Laboratory. — The work in Dairy Manufactures is carried on here. The building is well equipped with modern machinery for the production of market milk, ice-cream, butter and cheese. In addition there are the laboratories of Horticultural Manufactures for the scientific and economical preservation of food. This building was erected in 1911 and was named in honor of Charles L. Flint, fourth president of the College.

Stockbridge Hall. — Here are located the departments of Agronomy, Animal Husbandry, Agricultural Engineering, Farm Management, Poultry Husbandry, Education and English. In addition to the lecture rooms and offices are laboratories for soil fertility, field crops, poultry, and a drafting room for engineering. The clothing and house furnishing laboratories for the Home Economics Department are also located here. In the rear of the building are the green house and head house used by the Department of Agronomy for work on crops and soils. A special reference library for the Division of Agriculture is on the second floor. Bowker Auditorium, the largest auditorium on the campus is also in this building. It has a seating capacity of nine hundred and is named in honor of William H. Bowker, a member of the first graduating class, later a Trustee of the College, and one of the pioneers in the fertilizer industry. Stockbridge Hall was erected in 1914 and named in honor of Levi Stockbridge, a former president and professor of Agriculture in the College.

Grinnell Arena. — Such work in Animal Husbandry as pertains to livestock judging and study is carried on in the Grinnell Arena. This building erected in 1910, is located near the livestock barns and is especially designed for judging work.

Rural Engineering Shop. — Included in this laboratory for students of Rural Engineering, located a short distance back of Stockbridge Hall, are a carpenter shop, general repair shop, and a laboratory for farm machinery and motors. The building was erected from 1916 to 1924.

Draper Hall. — The college dining hall is located in Draper. The main dining room has a seating capacity of three hundred and seventy. In addition there is a cafeteria in the west wing which can accommodate about ninety-five at one time. The capacity of the dining hall during a normal meal hour is about six hundred, although as many as one thousand can be accommodated. There is a small banquet room on the second floor and several dormitory rooms. Erected 1902 and subsequently, and named in honor of James Draper, for twenty years a trustee of the college.

Goessmann Laboratory. — This is a modern chemical laboratory. The building is approximately two hundred feet by eighty feet and contains eight large laboratory rooms, a large auditorium, a chemical library, and lecture rooms. The east wing of the third floor is occupied by the research professors in Chemistry of the Experiment Station. In addition to the work in Chemistry the class work in German is held in this building. Goessmann Laboratory was erected in 1924 and named in honor of Charles A. Goessmann, the first professor of Chemistry at the college.

West Experiment Station. — The state control work is centralized here. Fertilizers, seeds, and feeds are analyzed or inspected in accordance with the state law, to determine whether or not they meet their guarantee. Erected, 1886.

East Experiment Station. — The office of the Director of the Experiment Station and other administrative offices of the Experiment Station are located in this building.

Abigail Adams House. — This is a modern girls' dormitory accommodating about one hundred students. It was erected in 1919 and named for Abigail Adams, a staunch believer in farm life, the wife of John Adams, second President of the United States. In the rear of the building is a large athletic field used in connection with the physical training work of the women students.

Bacteriology and Physiology Laboratory. — This building, erected in 1915, is especially designed to carry on work in Bacteriology as it relates to soil, industry, dairying, foods and public health. There are four class laboratories, several private laboratory rooms and offices and a lecture room. In addition there are incubator rooms, sterilizing rooms, hood rooms, washing rooms, inoculating rooms, weighing rooms, an animal room, a photographic and dark room, and a sub-basement refrigerator room. There is also a well equipped library containing books and current periodicals useful in the conduct of bacteriological and physiological work and investigation.

Infirmary. — The infirmary consists of two small cottages on the hillside in the rear of the Bacteriology Laboratory. They are especially designed to care for sick or injured students. A trained nurse is on duty at all times to assist in the needs of the patient.

Physics Building. — This is a small wooden building erected in 1867. It contains a well equipped laboratory for work in college Physics and also one lecture room.

Wilder Hall. — Here are located the departments of Landscape Gardening and Pomology. The building is chiefly devoted to class rooms, drafting rooms, and offices. It was erected in 1905 and named in honor of Marshall P. Wilder, a pioneer in the movement for agricultural education in Massachusetts and one of the first Trustees of the college.

Fisher Laboratory. — This is a well planned and equipped fruit packing and storage house. It includes six refrigerator rooms, four storage rooms not refrigerated, one large laboratory room, one class room besides ample storage space for fruit packages and equipment. The equipment for the building itself includes four types of apple sizers, packing tables and box and barrel presses of various types, besides all kinds of packages with smaller equipment necessary for thoroughly modern work in grading and packing fruit. This building is used by the Pomology Department and was named in honor of Jabez Fisher, one of the foremost, early horticulturists of the State. Erected 1910. Just east of Fisher Laboratory is the Horticultural Manufactures shed containing equipment for making cider, vinegar, and maple syrup.

French Hall. — French Hall houses the departments of Floriculture, Forestry, Horticulture and Vegetable Gardening. It is also the headquarters of the Northeastern Forest Experiment Station. The classroom work in Economics, Sociology, French and Spanish is also given here. Just to the rear of the building is the new Durfee range of greenhouses, devoted to the growing of carnations, roses, chrysanthemums, violets, etc. One house is maintained as a conservatory and contains a collection of plants used primarily for decorative purposes. Another house is devoted to greenhouse vegetables. The old Durfee range located just to the north of French Hall is used chiefly for the growing and maintenance of a collection of conservatory plants. There are also many of economic value such as the bamboo, camphor tree, guava, palm, etc. French Hall was erected in two sections; the first in 1908, the second in 1913. It was named in honor of Henry S. French, the first President of the college.

Clark Hall. — Here are located the offices, lecture rooms and laboratories of the Botany Department. The herbarium contains about twenty thousand sheets of seed plants and ferns, twelve hundred sheets of liverworts and mosses and twenty-five thousand specimens of fungi. Erected in 1906 and named in honor of William S. Clark, President of the college from 1867 to 1879.

Fernald Hall. — This building, erected in 1909, was named in honor of Professor Charles H. Fernald, who served the college for twenty-four years, built up a strong department in Zoölogy, created the department of Entomology, and acted as Director of the Graduate School. Fernald Hall houses the Departments of Zoölogy, Geology, and Entomology. In addition to laboratories, lecture rooms, and offices, there is a Geological Museum, a Zoölogical Museum and a collection of over 160,000 insects. Material in these collections is available for study and for exhibition purposes. In the basement is located the cooking laboratory of the department of Home Economics.

Mathematics Building. — This is a small frame building containing classrooms for instruction in mathematics and surveying. There is also a well equipped drafting room, and a small one devoted to blue printing.

Paige Laboratory. — The work in Veterinary Science is located in this building. In addition to the class, lecture, and laboratory rooms, there are the laboratories for the State Control and Research work on animal diseases. The museum contains a growing number of anatomical and pathological specimens most of which are used for teaching purposes. In the rear of the building are the stables for housing both laboratory and larger animals under isolation conditions for dissection, post mortem examinations and for incineration purposes. Paige Laboratory was erected in 1898 and named for James E. Paige, a former Professor of Animal Pathology.

Drill Hall. — Here are located the offices of the Military and Physical Education Departments. Included is a basket ball floor, shower baths, lockers, and an indoor rifle range. The whole building was remodeled in 1927.

Alumni Field. — This tract of land was transformed into an Athletic Field, containing a baseball diamond, football field, and cinder track by the Alumni and friends of the college. Completed 1915.

Riding Park. — Just south of the Drill Hall is a small riding park used for exhibition purposes by the military unit.

Memorial Hall. — The social center of student life is Memorial Hall. It was erected by the Alumni, students, faculty and friends of the college in memory of those M. A. C. heroes who died in the World War. In the basement are bowling alleys, pool tables, a store, post office and barber shop. On the main floor are eight offices for the leaders of various student activities, a large reading room and a beautiful Memorial Room in which is found a tablet bearing the names of the sons of the college who gave their lives in the Great War. On the second floor is an auditorium seating 350 persons. This room is also used for college dances. Memorial Hall was erected in 1921.

Library. — This was originally the college chapel. It now contains one of the best agricultural libraries in the country. There are about 77,000 bound books together with a greater number of unbound books, pamphlets, magazines, etc. The collection covers the general field of agriculture, science, literature, history and sociology. The periodical file contains over 400 magazines and newspapers. The library is open during terms from 8 A.M. to 10 P.M. daily and from 10 A.M. to 1 P.M. Sundays, with shorter hours during vacation. This building was erected in 1885.

Power Plant. — Heat and light are supplied to all the buildings on the campus from a central power plant. This was erected in 1902 and has been subsequently remodeled.

FARM BUILDINGS, LAND AND EQUIPMENT.

College Farm and Barns. — The college farm consists of 240 acres located just west of South College. Most of it is suitable for cultivation and is operated in regular rotation. Much of the farm as it now stands has been made productive by tile draining and clearing the land of brush and stumps. The principal crops raised are those which can be utilized by the livestock together with some cash crops such as cabbage, carrots, potatoes, and hay. For instructional work the farm is available for study in field crops, planning of crop rotation, practical field operation of farm machinery and tractors and farm management. The livestock of the farm consists of about 165 head of registered cattle which are excellent representatives of the Ayrshire, Guernsey, Holstein, Jersey, Milking Shorthorns, and Hereford breeds, a considerable number of registered Berkshire and Chester White swine, a flock of about 100 Shropshire and Southdown sheep and 20 Percheron horses. These animals are used chiefly for demonstrational and instructional work in feeding and herd management and in the teaching of correct types by much practice in judging. The farm buildings are model structures for their various purposes. They were erected in 1909 and subsequently. The dairy barns contain efficient and modern equipment for their respective purposes. The sheep barns and piggery are located several hundred yards down from the dairy barns.

Cavalry Stable. — This stable has a capacity for the sixty horses which are used by the M. A. C. Cavalry troop. This building is maintained by Federal expense. Erected in 1925.

Poultry Plant. — The college poultry plant consists of about twenty acres of land in addition to the various buildings that go to make up a modern poultry plant. Although only eight acres of the land comprising the plant are college owned this quantity permits for a three-year growing rotation. The plant will accommodate 2,000 laying birds and has growing facilities for about 7,000 chicks. The incubator capacity of the plant is approximately 12,000 eggs at one time. Located about one-half mile east of the college on East Pleasant Street, is the experimental poultry farm which accommodates about 1,200 adult birds and has hatching facilities for about 3,000 chicks. Here experiments on breeding poultry for egg production and disease control are carried on under strict quarantine.

The Hatch Barns. — These structures house the live stock which have been segregated from the main herd and flocks for the purpose of experimentation work in connection with the subject of feed and feeding. Erected in 1891.

Experiment Station Barns. — These buildings contain the equipment and animals used in connection with the work of the Massachusetts Experiment Station.

Orchards and Vineyards. — The college orchard contains about 20 varieties of peaches, 25 of plums, 20 of pears, and 100 of apples. Common varieties of grapes are grown in the vineyards and with the various approved trellis systems. These orchards are used for teaching material in Pomology.

Vegetable Gardens. — Here are grown the class material used by the vegetable gardening department.

Mt. Toby Demonstration Forest. — This is an area of approximately 750 acres located on Mt. Toby. It contains the various types of forest growth found throughout the State. It serves as a field laboratory in forestry. Students have the privilege of working out problems in silviculture, forest mensuration and management. Improvement cuttings, cuttings for utilization and forest planning are conducted here also.

COURSES OF INSTRUCTION.

Collegiate Courses.

Four-year Collegiate Course. — The degree of Bachelor of Science is granted to those students satisfactorily completing the four years' work of collegiate grade. The field of instruction covers agriculture, horticulture, landscape gardening, natural science, social science, the humanities, and home economics.

Graduate School. — Students with the necessary qualifications may register in the Graduate School. The degrees of Master of Science, Master of Agriculture, Master of Landscape Architecture, Doctor of Philosophy, and Doctor of Agriculture may be granted upon the completion of satisfactory study, research, and a thesis.

Summer School. — Both graduate and undergraduate courses are offered in the six weeks' summer school. Only courses of collegiate grade are offered. Credits earned may count toward the Bachelor of Science degree or advanced degrees.

Non-Collegiate Courses.

Several short courses of non-collegiate grade are offered to meet the needs of those both young and old who through lack of preparation cannot qualify for the college course, or who desire only practical training in the modern accepted methods of farming. These courses are planned to help the farmer and the housewife.

Two-Year Course in Practical Agriculture. — This course is designed to provide practical information and training in agriculture and horticulture. It is not equivalent to study in the college course. Subjects taken here cannot be used for college credit.

The Winter School. — Beginning about January first a ten weeks' winter school is given. Practical courses in agriculture and horticulture are offered and are so arranged that a student may choose such subjects as will enable him to specialize along the line of work in which he is most interested.

One-Year Vocational Poultry Course. — This course is designed for those who wish an intensive course preparing them for practical poultry.

STUDENT EXPENSES.

Tuition. — Residents of Massachusetts are charged a tuition fee of $60 per year, payable in advance in three installments of $20 each on the first day of each term. For those who are not residents of Massachusetts, the tuition fee is $180 per year. Students entering from Massachusetts are required to file with the Treasurer a statement signed by either town or city clerk, stating that the applicant's father is a legal resident of Massachusetts.

Matriculation Fee. — All students entering the college for the first time as undergraduates or two-year students, are charged a matriculation fee of $5.00 which in the event of a student leaving the institution is returned, if all bills due the college are paid, or is upon graduation, considered as payment for the diploma.

Rooms for Men. — Dormitory accommodations for men are available for about 62 students. Drawings for these rooms are made the latter part of May. Practically all such rooms are assigned to upper classmen at that time. Freshmen usually obtain rooms in private dwellings located near the campus. In most cases these rent for from $2.50 to $4 per week, depending somewhat on location, and whether or not they are single or double. Such rooms are usually furnished. Students desiring aid in obtaining rooms should write to the Assistant to the Dean. The college does not secure these rooms for the student but does keep a desirable list for student aid.

Rooms for Women. — Dormitory accommodations for women are available at the college for 105 girls. Applications for rooms should be made to the Advisor of Women. A freshman cannot be assigned to a room at the dormitory until her entrance record has been accepted by the Dean. A deposit of $5 is required when a room is reserved. The rental is $33 to $39 per term. Rooms in the dormitory are furnished except for necessary bedding or linen. They are cared for by the students occupying them.

Board. — All freshmen are required to board at the college dining hall. Upper classmen either board here or at private dining places. All women students living in college dormitories are required to board at the dining hall. The cost of board at the dining hall is $255 per year payable as follows:

At the opening of college	$79 00
December 1st	18 50
January 3d	82 50
March 26	75 00

Rebates at the rate of $6 per week may be granted for absences in excess of one week. No rebates will be allowed for absences of less than one week, unless the absence is authorized by the Dean, and the rebate approved by the Treasurer.

Additional Expenses. — In addition to the above charges there are additional expenses, such as laboratory fees, a military uniform deposit for those taking military drill, expenditures for books and stationery and certain class assessments and taxes levied for the maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, and so on.

Initial Payments. — The initial payment required of freshmen by the Treasurer's Office at the time of fall registration varies from about $100 to $150 depending on whether or not the student takes military and has a room in the dormitory.

Summary of Expenses. — The following is a summary of expenses for the year. The student should realize that these are strictly college expenses and do not include amounts for clothing, traveling, etc., expenses which vary with the individual.

Estimate of College Expenses.

Tuition: citizens of Massachusetts, $60; others, $180 per year.

	Low.	High.
Tuition (citizens of Massachusetts)	$60 00	$60 00
Matriculation fee (first year)	5 00	5 00
Room in college dormitories or in private houses	39 00	140 00
Board, $7.50 per week (College Dining Hall)	255 00	255 00
Laundry, 50 to 85 cents a week	18 00	30 00
Laboratory fees	8 00	25 00
Books, stationery and miscellaneous item	40 00	60 00
	$425 00	$575 00

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STUDENT EMPLOYMENT.

The college affords opportunity for part time employment for a limited number of needy students. The number of applicants for labor far exceeds the number that the institution can fill, however, so that no guarantee can be made that a student will find employment through the college. In many instances students find outside work through their own initiative. Among the permanent college positions are several janitorships. Forty or more students are employed at the dining hall. In addition the various college departments have work from time to time. Applications for student labor should be made to the Secretary of the College. Only those students are eligible for permanent campus employment whose need has been investigated by the employment committee and who have been certified as being eligible for such employment. Very few permanent campus positions are held by freshmen. For this reason freshmen are not advised to enter the college without at least $300 to $400 in cash, or enough to carry them the major portion of the year. Although they do find odd jobs about the college or town the amount of money that can be earned is usually small. Moreover, studies require practically all of the time of the beginning student. Students with insufficient funds are advised to work a year before entering college rather than attempt to carry too heavy a study and work load while in college. Those who elect military drill at the beginning of the junior year are paid by the Federal Government at the rate of 30¢ per day while in college.

SCHOLARSHIPS AND LOANS.

Several scholarships and loan funds are available for needy students. Applications for these funds should be made to the Dean of the college.

The Wilbur H. H. Ward Educational Trust Incorporated. — This is a gift of $100,000 from Wilbur H. H. Ward. The income is available for the assistance of needy boys first from Amherst and then from Hampshire County who attend the Massachusetts Agricultural College. This fund is administered by a Board of Trustees not connected with the college. Application blanks for assistance from this fund may be secured from the Dean of the College.

Frederick G. Crane Fund. — The family of the late Frederick G. Crane of Dalton has presented to the Massachusetts Agricultural College a gift of $25,000 to establish a fund in memory of Frederick G. Crane, the income therefrom to be expended by the Trustees in aid of worthy undergraduate students of limited financial resources attending the college, preference being given to residents of Berkshire County. Grants made from this fund are to be known as the Frederick G. Crane scholarships. Applications for assistance from this fund can be made to the Dean of the College.

Porter L. Newton Fund. — This is a gift of $23,411 from the late Porter L. Newton of Waltham. The income from this fund is to be used for scholarships for worthy undergraduates of the Massachusetts Agricultural College.

The Alvord Dairy Scholarship Fund. — This is a gift of $4,000 from Henry E. Alvord, who was the first instructor in Military Tactics, 1869–71, and instructor of Agriculture 1885–1887, at this college. The income of this fund is to be applied to the support of any worthy student of said college, graduate or post-graduate, who may be making a specialty of the dairy husbandry, broadly considered, with the intention of becoming an investigator, teacher or special practitioner in connection with the dairy industry, provided that no benefit arising from such fund shall at any time be applied to any person who then uses tobacco in any form or fermented or spirituous beverages, or is known to have done so within one year next preceding.

The Whiting Street Scholarship Fund. — This is a gift of Whiting Street of Northampton, for no special purpose but to be invested and the income used. The gift is $1,000. The fund is now used exclusively for scholarships.

Mary Robinson Fund. — This is a gift of $1,000 from Miss Mary Robinson of Medford. It is used for scholarships.

Gassett Scholarship Fund. — This is a gift of $1,000 from Henry Gassett of Boston. The income is used for scholarships.

Danforth Keyes Bangs Fund. — This is a gift of $6,000 from Louisa A. Baker of Amherst, the income of which is to be used annually in aiding poor, industrious, and deserving students to obtain an education in the Massachusetts Agricultural College.

Charles A. Gleason Fund. — This is a gift of $5,000 from Charles A. Gleason of North Brookfield, Massachusetts, a trustee of the college from 1889 to his death, September 29, 1925. This fund is to be used as the Trustees of the college shall direct. It is now used as a loan fund.

Phi Kappa Phi Scholarship Fund. — Massachusetts Chapter of the Phi Kappa Phi Honorary Scholarship Society offers an award for outstanding work in scholarship. This is given to some member of the Senior class at the opening of college in the fall. The award is based on the record of the first three years. For the college year 1927–1928 this scholarship was $250.

Massachusetts Agricultural Club Fund. — The Massachusetts Agricultural Club has given $500 to be used as a scholarship fund at the Massachusetts Agricultural College to help out deserving students there who intend to go into agriculture. Interest on loans is not charged until after graduation.

In addition to the above scholarships are similar ones given by local Rotary and Kiwanis Clubs, Chambers of Commerce, etc. Students are advised to look these up in their own towns.

PRIZES AND AWARDS.

Prizes are offered annually in several departments for excellence in study and for other special achievements. The prizes offered in 1927 were:

The Grinnell Prizes. — Given by the Hon. William Claflin of Boston, in honor of George B. Grinnell, Esq., of New York, for excellence in theoretical and practical agriculture. The contest is open to those senior students whose records on the registrar's books show an average standing of 80 or above for the technical work taken in the Divisions of Agriculture and Horticulture during the junior and senior years. There are three prizes of $25, $15, and $10.

The Burnham Prizes. — These were made possible through the generosity of Mr. T. O. H. P. Burnham of Boston. Prizes of $15 and $10 are awarded to those students delivering the best and second best declamations in the Burnham contest. The preliminary contests are open under certain restrictions to freshmen and sophomores.

The Flint Prizes. — The Flint Oratorical Contest was established in 1881 by a gift of the late Charles S. Flint, a former trustee of the college. After his death the prizes were continued by college appropriation. Prizes of $30 and $15 are awarded as first and second prizes to those two students delivering the best orations in this contest.

The Hills Botanical Prize. — This is given through the generosity of Henry F. Hills of Amherst, for the first and second best herbaria. Competition is open to members of the senior, junior, and sophomore classes.

The Allan Leon Pond Memorial Medal. — This medal is awarded for general excellence in football in memory of Allan Leon Pond of the class of 1920, who died February 26, 1920. He was a congenial companion, a devoted lover of Alma Mater, a battle-scarred, though youthful, veteran of the Great War, a fine all round athlete and a true amateur. He would rather win than lose, but he would rather play fair than win. He has been characterized as a typical "Aggie" man.

The Frederick Cornelius Eldred Memorial Athletic Prize. — This is a prize established by Frederick Cornelius Eldred of the class of 1873, famous oarsman and pioneer in athletics at M. A. C., who trained, coached and stroked crews for intercollegiate races — two to victory. "A prize of one hundred dollars may be awarded at Commencement to that member of the senior class who has represented the College in intercollegiate athletic contests for a period not less than two years and who has attained the highest average standing in scholarship during his course."

Academic Conspicuous Service Trophy. — This trophy is awarded to that student who, during the past 12 months has made the most important, single contribution, to the Academic Activities.

The Southern Alumni Baseball Cup. — This cup is awarded to that member of the baseball team who contributes most to the success and reputation of the team, both in respect to skill and spirit.

Phi Kappa Phi Elections. — Those members of the senior class whose scholarship average has been 85 or above are eligible for election to the Honorary Scholarship Society of Phi Kappa Phi. Not more than 15% of the class can be elected, however.

STUDENT ACTIVITIES AND ORGANIZATIONS.

No small part of the value received from four years of college is the training that one acquires through participation in student activities. Student organizations offer excellent opportunities for leadership in a wide variety of fields.

Student Government.

The Senate. — This is a student governing council. It is composed of representatives elected from the Junior and Senior classes. Besides acting as general director of undergraduate conduct it represents the interests of the students and the student body before the Faculty.

Adelphia. — This is a senior honorary society. The members are usually chosen from those who have been prominent in college activities. This society attempts in a quiet, unassuming way to mold student life on the campus.

The Honor Council. — The Honor System prevails at this college. The foreword of the Honor System reads as follows: "We, the students of the Massachusetts Agricultural College, believe that the goal of education is character. The man of character deals fairly with himself, and with others, and would rather suffer failure than stoop to fraud. The Honor System stands for this attitude in all relations of the students with the Faculty. In expression of our belief we pledge ourselves to the support of the constitution of the Honor System." Matters pertaining to the Honor System are in direct charge of the Student Honor Council, consisting of members elected from the four classes.

The Women's Student Council. — All appropriate matters pertaining to the conduct of women students are under the control of this council. It is composed of members selected from the senior, junior, and sophomore classes by all the women students.

College Publications.

The Massachusetts Collegian. — This is a weekly newspaper, published by the undergraduates of the college.

The Index. — This is the college yearbook published by the members of the Junior Class.

The Alumni Bulletin. — This is the official organ of the Alumni of the college. It is issued from the office of the Alumni Secretary.

College Fraternities.

There are several national and local fraternities represented on the campus. Rushing rules and general matters dealing with fraternity life are in charge of the Inter-fraternity Conference. This conference awards scholarships, a baseball cup, and a relay placque to the winners of the Inter-fraternity Contests.

Academic Activities.

The College Musical Clubs include an orchestra, a Girls' Glee Club, and a Boys' Glee Club. These give a number of concerts during the year, both in Amherst and on tour.

The Dramatic Club, the Roister Doisters, presents annually a revue and two plays, one in connection with the Junior Promenade, and the other at Commencement. There is a Debating Society which conducts both class and inter-collegiate debates. All academic activities are supervised by the Academic Activities Board composed of Alumni, Faculty, and students.

Religious Organizations.

The Young Men's Christian Association and the Young Women's Christian Association are active both on the campus and off. In addition there is a Catholic Club, and a Jewish Menorah Society. The Cosmopolitan Club has as its object the cultivation of peace and the establishment of strong international friendship.

Professional Clubs.

There are several professional clubs established in connection with the major work of the college. Included among these is an Animal Husbandry Club, Landscape Art Club, Pomology Club, Agricultural Economics Club, and Floricultural Club.

The Social Union.

The Social Union was established in 1907. All students become members of the Union by paying a small fee. In the fall and winter months the Union gives a series of entertainments free to students and faculty.

Inter-Collegiate Athletics.

The College is represented in inter-collegiate athletics by teams in all the leading sports, including football, baseball, track, hockey, and basketball. General policies governing athletics are in charge of the Athletic Board, composed of Alumni, Faculty, and students.

HEALTH PROGRAM.

Physical Examinations. — All men students entering as freshmen are required to undergo a physical examination upon arrival at college. This examination is given during matriculation week. All women students entering as freshmen are required to present a health certificate. This involves a physical examination before coming to college.

The College Infirmary. — The college endeavors to safeguard the health of the students while on the campus. A resident nurse is on duty at the Infirmary at all times. Students are urged to go to the Infirmary at any time that they are in need of the services of such a nurse or of those of a town physician. Inasmuch as the Physical Director gives special attention to all student diseases it is to be expected that the majority of the students will go to the infirmary at his suggestion. This understanding should in no way deter students from going voluntarily at any time. Students are urged to consult the Physical Director or the resident nurse immediately when signs of physical disorder appear. Severe attacks of cold or other forms of illness can usually be avoided if treatment is administered in the incipient stage. The purpose of the infirmary is to help maintain the general good health of the students, as well as to furnish a suitable place for professional attention in cases of severe illness or accident. The infirmary fee will be at the rate of $2 per day and will be charged when one or more meals are obtained at the infirmary, or when the student remains at the infirmary for one or more nights. A nominal charge will be made to out-patients for miscellaneous treatment of a minor character. In addition to the above fees, additional expenses may be charged to the patient under certain conditions. In case a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient, but the nurse will be under the general supervision of the resident nurse. If a student requires medical attention by a physician he will be required to select his physician and become responsible for fees charged by the physician. Special medical supplies prescribed by a physician or nurse will be charged to the patient. Expense for personal laundry incurred by students while in the infirmary will also be charged to the individual student.

FRESHMAN REGISTRATION.

All members of the incoming freshman class are required to be in residence on the campus for the period September 10 to September 15, 1928, inclusive. This period is known as Freshman Week. During this week will be given the several psychological examinations and tests required of freshmen. In addition physical examinations will be given to the men students. Such matters as pertain to schedule and section assignments will be taken care of at the same time. Lectures on student activities, college customs, and college curriculum will be given also. The object of this week is to introduce the new student into the college, so that only the minimum amount of time will be lost when the actual studies begin.

STUDENT RELATIONS.

The customary high standard of college men and women in honor, manliness, self-respect and consideration for the rights of others constitutes the standards of student deportment.

The privileges of the college may be withdrawn from any student at any time, if such action is deemed advisable.

It should be understood that the college, acting through its president or any administrative officer designated by him, distinctly reserves the right, not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may also be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences ("cuts"). According to the rules a student is allowed a certain percentage of absences from class and other exercises. This permission, which implies a privilege and not a right, may be withdrawn at any time for any cause.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet, if in the judgment of the college authorities, a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct. Prospective students or their parents may, upon application, obtain a copy of the faculty rules governing student relations to the college.

SPECIAL APPOINTMENTS AT BOSTON.

A representative of the college will be at the State House in Boston, the second and fourth Thursday of each month from 1:30 to 4 o'clock in the afternoon. Any one desiring information in regard to entrance, courses, or other matters pertaining to college instruction can obtain a personal interview at that time by calling at the information office of the Department of Education. No guarantee of an interview is made, however, unless the appointment has been arranged for in advance by writing to the Dean of the College at Amherst, Massachusetts.

ADMISSION TO COLLEGIATE COURSES.

A. APPLICATION FOR ADMISSION.

Correspondence concerning admission should be addressed to the Dean's office.

Every applicant for admission to the college must be at least sixteen years old, and must present to the Dean proper testimonials of character, which, whenever possible, should come from the principal of the school at which the applicant has prepared for college. Candidates who desire to present themselves for examination in any subjects must make application to the college for such privilege at least one month before the date of the examination. Blanks for such application may be obtained by addressing the Dean of the college. All entrance credentials must be in the hands of the Dean before the applicant can matriculate.

B. MODES OF ADMISSION.

Students are admitted to the freshman class either upon certificate or upon examination. No *diploma* from a secondary school will be accepted.

CERTIFICATES. — The Massachusetts Agricultural College is affiliated with the New England College Entrance Certificate Board. Therefore certificates of admission will be accepted from schools approved by the Board. Certificates of admission will also be accepted from any Massachusetts school listed as class "A" by the State Department of Education, but not included in the approved lists of the New England College Entrance Certificate Board. Principals of schools in New England who desire the certificate privilege should address the secretary of the Board, Professor Frank W. Nicolson, Wesleyan University, Middletown, Conn. Certificates from schools outside of New England may be received if those schools are on the approved list of the leading colleges of the section in which the school in question is located.

The credentials of the Board of Regents of the State of New York are accepted as satisfying the entrance requirements of this college when offered subject for subject.

Certificates in order to be accepted must present in the prescribed and restrictive elective groups at least three of the necessary fourteen and one-half credits. It is to be understood, however, that responsibility for certification in either elementary French, elementary German, English 1 or English 2, Latin A, Greek A or algebra must be assumed by one school, if the candidate has received his preparation in any one subject named above in more than one school. Subjects lacking on certificate must be made up at the time of the examinations for admission. Conditions to the amount of two units will be allowed.

SPECIAL CERTIFICATE ARRANGEMENT FOR STUDENTS FROM AGRICULTURAL SCHOOLS. — Superior graduates of Vocational Schools of Agriculture in Massachusetts and Vocational Agricultural Departments in Massachusetts High Schools may be accepted for the Degree of Vocational Agriculture provided: —

(*a*) they are unqualifiedly recommended by the Vocational Division of the Department of Education as bona fide Vocational Graduates with superior rank; and (*b*) that they can present at least $14\frac{1}{2}$ units of certified entrance credits, approved as to quality and quantity by the State Department of Vocational Education.

Blank forms for certification — sent to principals or school superintendents only — may be obtained on application to the Dean of the college.

EXAMINATIONS. — The examination in each subject may be oral or written, or both. The standard required for passing an examination for admission is 60 per cent.

Entrance examination for admission to the Massachusetts Agricultural College will be held at the following centers: —

In June	Amherst, Stockbridge Hall, room 114. Cambridge, Massachusetts Institute of Technology. Worcester, Worcester Polytechnic Institute.
In September . . .	Amherst, Stockbridge Hall, room 114.

Please note that September examinations are held in Amherst only.

Schedule for Entrance Examinations June 14–16, 1928.

First Day.

8.30 A.M.	Algebra.
10.30 A.M.	Chemistry.
2.00 P.M.	History (ancient, medieval and modern, English, general, United States and Civics).

Second Day.

8.30 A.M.	English 1 and 2.
11.30 A.M.	Botany.
2.00 P.M.	Plane Geometry.
3.30 P.M.	Physics.

Third Day.

8.30 A.M.	French, German, Spanish, required and elective.
1.00 P.M.	Latin, elementary, intermediate and advanced, and all one-half credit electives, except those already noted.

Schedule for Entrance Examinations September 5–8, 1928.

First Day.

2.15–5.00 P.M.	Greek, elementary and intermediate.

Second Day.

8.30 A.M.	Algebra.
10.30 A.M.	Chemistry.
2.00 P.M.	History (ancient, medieval and modern, English, general, United States and Civics).

Third Day.

8.30 A.M.	English 1 and 2.
11.30 A.M.	Botany.
2.00 P.M.	Plane Geometry.
3.30 P.M.	Physics.

Fourth Day.

8.30 A.M.	French, German, Spanish, required and elective.
1.00 P.M.	Latin, elementary, intermediate and advanced, and all one-half credit electives, except those already noted.

C. REQUIREMENTS FOR ADMISSION.

The requirements for admission are based on the completion of a four-year high school course, or its equivalent, and are stated in terms of units. The term unit means the equivalent of at least four recitations a week for a school year.

Fourteen and one-half units must be offered for admission in accordance with the entrance requirements as stated below.

Entrance Requirements.

1. *Prescribed.* — The following units are prescribed: —

English 1	2
English 2	1
A foreign language	2
Algebra	1½
Plane geometry	1
	7½

2. *Restricted Electives.* — Three units to be selected from —

Science	1, 2 or 3
History (American history and civics included)	1, 2 or 3
A second foreign language	2 or 3
Additional work, in first foreign language	1 or 2

3. *Free Margin.* — Free margin of four units to consist of any substantial work (including agriculture, general science and a fourth year of English) for which credit of not less than one-half unit earned in one year is given toward a secondary school diploma. Units presented in the free margin group may be offered only by certificate.

4. One unit of history must be offered in either the restricted electives or the free margin.

5. If elementary algebra and plane geometry are counted as three units, the total requirement will be fifteen units.

6. Both the credits under the prescribed group and the restricted elective group must be presented either by certificate from an approved school or by examination, or by a combination of both.

The following is a list of subjects in which the entrance credits must be offered in the prescribed and restricted elective groups: —

Mathematics and Science.

Botany[1]	½ or 1
Chemistry[1]	1
Algebra	1½
Plane geometry	1
Solid geometry	½
Trigonometry	½
Physics[1]	1
Geology	½
Physical geography	½
Physiology	½
Zoölogy[1]	½

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[1] NOTE-BOOKS. — The keeping of a note-book is required as part of the preparation in those subjects indicated. Candidates presenting themselves for examination in such subjects must present at the same time a statement signed by the Principal to the effect that a satisfactory note-book has been kept by the candidate.

History.

Ancient	1
Medieval and modern	1
English	1
General	1
United States and civics	1

English.

English 1	2
English 2	1

Foreign Language.

Elementary French	2
Elementary German	2
Elementary Spanish	2
Elementary Latin	2
Elementary Greek[1]	2
Intermediate French	1
Intermediate German	1
Intermediate Spanish	1
Intermediate Latin	1
Intermediate Greek[1]	1
Advanced French	1
Advanced German	1
Advanced Spanish	1
Advanced Latin	1

No applicant deficient in both algebra and plane geometry will be admitted.

D. STATEMENT OF PREPARATION REQUIRED FOR ADMISSION.

AGRICULTURE. — Entrance credit in agriculture is granted on the following basis: —

I. The Massachusetts Agricultural College accepts a maximum of four credits in agriculture from any secondary or county agricultural high school in Massachusetts offering work in that subject, provided evidence of such work having been done is submitted on a principal's statement, as is indicated in the "free margin" group.

II. In high schools organizing agricultural club work under the supervision and rules of the junior extension service of the college, one credit is granted for each full year of work performed under the following plan: —

Work of the Winter Term. — (*a*) The study of textbooks such as are suitable for secondary school instruction in agriculture.

(*b*) Course of Study: A general outline of suggested topics for study.

(*c*) Visits by a representative of the Massachusetts Agricultural College for observation, counsel and advice in regard to kind and amount of work being done in agriculture.

(*d*) Formation of an agricultural club with officers from among its own members, meeting once a month under local supervision of some one authorized to act for the school authorities.

Work of the Spring Term. — Same in general form as winter term.

Work of the Summer Term. — An approved project conforming to the rules of some one or more of the agricultural clubs of the junior extension service of the Massachusetts Agricultural College.

Work of the Fall Term. — (*a*) An exhibit of work.

(*b*) Reports and story of achievement submitted to the junior extension service of the college.

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[1] Examination in September only.

BOTANY. — For one unit of credit in botany, the work outlined in the statement of requirements issued by the College Entrance Examination Board, or its equivalent, will be accepted. This work should occupy one school year and include laboratory and supplementary textbook study. For one-half unit of credit, work that covers the same ground but occupies half the time required for a full unit of credit will be accepted. These requirements are met by such texts as Stevens' *Introduction to Botany* and Bergen & Davis *Principles of Botany*. A notebook, containing neat, accurate drawings and descriptive records forms part of the requirement for either the half-unit or the one-unit credit, and this notebook must be presented by all applicants for admission upon examination in this subject. The careful preparation of an herbarium is recommended to all prospective students of this college, although the herbarium is not required.

CHEMISTRY. — The entrance examination in chemistry will cover the work outlined by the College Entrance Examination Board as preparatory for college entrance. In general, this consists of a year of high school chemistry from any standard textbook, with laboratory work on the properties of the common elements and their simpler compounds. No particular work is prescribed. The keeping of a notebook is required.

A certificate stating that a satisfactory notebook has been kept should be submitted at the time of examination. In such a case it is not necessary to present the notebook. If the notebook is presented it must be certified.

Students who do not take chemistry in the preparatory school begin the subject in college.

MATHEMATICS. — (*a*) *Required.* — Algebra: The four fundamental operations for rational algebraic expressions; factoring, determination of highest common factor and lowest common multiple by factoring; fractions, including complex fractions; ratio and proportion; linear equations, both numerical and literal, containing one or more unknown quantities; problems depending on linear equations; radicals, including the extraction of the square root of polynomials and numbers; exponents, including the fractional and negative; quadratic equations, both numerical and literal; simple cases of equations with one or more unknown quantities that can be solved by the methods of linear or quadratic equations; problems depending upon quadratic equations; the binomial theorem for positive integral exponents, the formulas for the nth term and the sum of the terms of arithmetic and geometric progressions, with applications.

Plane Geometry: The usual theorems and constructions of good textbooks, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle; the solution of numerous original exercises, including loci problems; applications to the mensuration of lines and plane surfaces.

(*b*) *Elective.* — Solid Geometry: The usual theorems and constructions of good textbooks, including the relations of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders and cones; the sphere and spherical triangle; the solution of numerous original exercises, including loci problems; applications to the mensuration of surfaces and solids.

Plane Trigonometry: A knowledge of the definitions and relations of trigonometric functions and of circular measurements and angles; proofs of the principal formulas and the application of these formulas to the transformation of the trigonometric functions; solution of trigonometric equations, the theory and use of logarithms, and the solution of right and oblique triangles.

PHYSICS. — To satisfy the entrance requirement in physics, the equivalent of at least one unit of work is required. This work must consist of both classroom work and laboratory practice. The work covered in the class-room should be equal to that outlined in Hall & Bergen's *Textbook of Physics* or Millikan & Gale; the laboratory work should represent at least thirty-five experiments involving careful measurements, with accurate recording of each in laboratory notebook. This notebook, certified by the instructor in the subject, must be submitted by each candidate presenting himself for examination in physics; credit for passing the subject will be given on laboratory notes and on the examination submitted.

Candidates entering on certificate will not be required to present notebooks, but the principal's certification must cover laboratory as well as class-room work.

PHYSIOLOGY. — Hough & Sedgwick's *The Human Mechanism;* Martin's *The Human Body; Briefer Course.*

ZOÖLOGY, PHYSICAL GEOGRAPHY, GEOLOGY. — The following suggestions are made concerning preparation for admission in the subjects named above: —

For physiography, Davis' *Elementary Physical Geography;* Gilbert & Brigham's *Introduction to Physical Geography.* For zoölogy, textbooks entitled *Animals* or *Animal Studies,* by Jordan, Kellogg and Heath; Linville & Kelley's *A Textbook in General Zoölogy.* For geology, A. P. Brigham's *A Textbook of Geology* or Tarr's *Elementary Geology.*

Applicants for examination in zoölogy are *required* to present certified laboratory notebooks; applicants for examination in the other subjects are *advised* to present notebooks, if laboratory work has been done. Good notebooks may be given credit for entrance. Examination in these subjects will be general, in recognition of the different methods of conducting courses; but students will be examined on the basis of the most thorough secondary school courses.

HISTORY. — The required unit must be offered in either ancient history, medieval and modern history, English history, general history, or United States history and civics. Either one, two or three elective units in any of the historical subjects here named may be offered, provided that no unit be offered in the same subject in which the required unit has been offered.

Preparation in history will be satisfactory if made in accordance with the recommendations of the committee of seven of the American Historical Association, as outlined by the College Entrance Examination Board. The examination will require comparisons and the use of judgment by the candidate rather than the mere use of memory, and it will presuppose the use of good textbooks, collateral reading and practice in written work. Geographical knowledge may be tested by requiring the location of places and movements on outline maps.

To indicate in a general way the character of the textbook work expected, the texts of the following authors are suggested: Botsford, Morey or Myers, in ancient history (to 814 A.D.); Adams, West or Myers, in medieval history; Montgomery, Larned or Cheyney, in English history; Myers or Fisher, in general history; Fiske, together with MacLaughlin or Montgomery, in United States history and civics.

ENGLISH. — The study of English in school has two objectives of equal importance: first, the ability to use the English language, in both speech and writing, clearly, correctly and effectively; and, second, the ability to read English literature with understanding and appreciation.

(1) *Grammar and Composition* (Two Units). — The first objective makes necessary a rigorous and reiterated instruction in grammar and composition, with special emphasis upon: spelling, sentence structure, punctuation and paragraph development. College freshmen are found deficient particularly in these fundamental phases of rhetoric.

(2) *Literature* (One Unit). — The second objective is sought by means of two lists of books, designated as *Books for Reading* and *Books for Study,* from which may be selected material for a progressive, four-year course in literature. The student should be trained to read aloud, to memorize significant passages, to associate the books with their historic background and to have well in hand both content and structure. He should be prepared for general examination on the former list and detailed examination on the latter. However accurate in subject matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling or other essentials of good usage.

LISTS OF BOOKS FOR 1926–1928.

1. *Books for Reading.*

From each group two selections are to be made, except that for any book in Group V a book from any other may be substituted.

Group I.

Cooper: *The Last of the Mohicans.*
Dickens: *A Tale of Two Cities.*
George Eliot: *Silas Marner.*
Scott: *Ivanhoe* or *Quentin Durward.*
Stevenson: *Treasure Island* or *Kidnapped.*
Hawthorne: *The House of the Seven Gables.*

Group II.

Shakespeare: *The Merchant of Venice, Julius Caesar, King Henry V, As You Like It, The Tempest.*

Group III.

Scott: *The Lady of the Lake.*
Coleridge: *The Ancient Mariner;* and Arnold: *Sohrab and Rustum.*
A collection of representative verse, narrative and lyric.
Tennyson: *Idylls of the King* (any four).
The Æneid or *The Odyssey* in a translation of recognized excellence with the omission, if desired, of Books I–V, XV, and XVI of *The Odyssey.*
Longfellow: *Tales of a Wayside Inn.*

Group IV.

The *Old Testament* (the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings and Daniel, together with the books of Ruth and Esther).
Irving: *The Sketch Book* (about 175 pages).
Addison and Steele: *The Sir Roger de Coverley Papers.*
Macaulay: *Lord Clive* or *History of England,* Chapter III.
Franklin: *Autobiography.*
Emerson: *Self-Reliance and Manners.*

Group V.

A modern novel.
A collection of short stories (about 150 pages).
A collection of contemporary verse (about 150 pages).
A collection of scientific writings (about 150 pages).
A collection of prose writings on matters of current interest (about 150 pages).
A selection of modern plays (about 150 pages).

All selections from this group should be works of recognized excellence.

2. Books for Study.

One selection is to be made from each of Groups I and II, and two from Group III.

Group I.

Shakespeare: *Macbeth, Hamlet.*

Group II.

Milton: *L'Allegro, Il Penseroso,* and either *Comus* or *Lycidas.*
Browning: *Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa — Down in the City, The Italian in England, The Patriot, The Pied Piper, De Gustibus, Instans Tyrannus, One Word More.*

Group III.

Burke: *Speech on Conciliation with America.*
Macaulay: *Life of Johnson.*
Arnold: *Wordsworth,* with a brief selection from Wordsworth's Poems.
Lowell: *On a Certain Condescension in Foreigners,* and *Shakespeare Once More.*

FRENCH. — Elementary: The necessary preparation for this examination is stated in the description of the two-year course in elementary French recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year French (elective subjects for admission). — For a third credit unit in French as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in French will be given unless the candidate has presented elementary French on certificate, or has written the examination in elementary French.

No examination for a fourth credit in French will be given unless the candidate has presented both elementary and intermediate French upon certificate, or has written the examination in both elementary and intermediate French.

GERMAN. — Elementary: The entrance requirements in German conform to those of the College Entrance Examination Board for elementary German (the standard two-year requirements).

Third and fourth year German (elective subjects for admission). — For a third credit unit in German as an elective subject for entrance, when required units have been offered in German, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in German will be given unless the candidate has presented elementary German upon certificate, or has written the examination in elementary German.

No examination for a fourth credit in German will be given unless the candidate has presented both elementary and intermediate German upon certificate, or has written the examination for both elementary and intermediate German.

SPANISH. — Elementary: The necessary preparation for this examination is stated in the description of the two-year course in elementary Spanish recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year Spanish (elective subjects for admission). — For a third credit unit in Spanish as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in Spanish will be given unless the candidate has presented elementary Spanish on certificate, or has written the examination in elementary Spanish.

No examination for a fourth credit in Spanish will be given unless the candidate has presented both elementary and intermediate Spanish upon certificate, or has written the examination in both elementary and intermediate Spanish.

GREEK. — *Elementary.* — Greek grammar and composition: Translation into Greek of short sentences illustrating common principles of syntax.

The examination in grammar and prose composition will be based on the first four books of Xenophon's *Anabasis.*

Intermediate. — Homer's *Iliad,* Books I and II (omitting Book II, 494 to end), and the Homeric forms, constructions, idioms and prosody.

Prose composition, consisting of continuous prose based on Xenophon, and other Attic prose of similar difficulty.

Translation of passages of Homer at sight.

The examinations in Greek, elementary and intermediate, will be given in September only.

LATIN. — *Elementary.* — Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (*a*) the translation of a passage or passages taken from Cæsar's *Gallic War*, covering at least four books, and (*b*) the translation of passages of Latin prose at sight.

Intermediate. — Cicero (third oration *Against Catiline* and the orations *For Archias* and *For Marcellus*) and sight translation of prose.

Advanced. — Vergil (*Æneid*, II, III and VI) and sight translation of poetry.

E. ADMISSION TO ADVANCED STANDING.

Candidates for admission to advanced standing, in addition to meeting the regular entrance requirements, must also pass examinations in those subjects already pursued by the class they desire to enter. To meet this requirement, a student transferring to this college from another college or university of recognized standing must present the following credentials: —

1. A letter of honorable dismissal from the institution with which he has been connected.
2. A statement or certificate of his entrance record.
3. A statement from the proper officer showing a complete record of his work while in attendance.
4. A marked catalogue showing the courses pursued.
5. A statement from the proper officer, giving the total number of credits required for graduation by the institution from which the applicant is transferring, and, of this total, the number that the applicant has satisfactorily completed at the time of transfer.

These credentials should be presented to the Dean. Applications will be judged wholly on their merits and the college may prescribe additional tests before accepting applicants or determining the standing to be granted them.

F. OTHER INFORMATION ABOUT ENTRANCE.

1. The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable. (It is immaterial whether the pupil has entered by certificate or by examination.)
2. The examination in each subject may be either oral or written, or both. The standard required for passing an entrance examination is 60 per cent.
3. To matriculate, candidates must offer twelve and one-half of the fourteen and one-half units required for admission, and will be conditioned in those subjects not passed. At least five and one-half credits must be in the prescribed group. No candidate deficient in both algebra and plane geometry will be admitted.
4. Examinations for the removal of entrance conditions will be held during the first week of the second term.
5. Candidates are allowed to spread their entrance examinations over the three consecutive periods just previous to their entrance into college. A period means June to September of the same year.
6. Application for admission as a "Special Student" should be made to the Dean.
7. All entrance conditions must be removed before a student is permitted to enter upon the work of the sophomore year.
8. No student shall be recommended to receive the Bachelor of Science degree unless he or she has done at least one year's work in residence.

COLLEGIATE COURSES OF INSTRUCTION.

The collegiate course of study consists of four years of college work planned to provide scientific foundation, cultural background, and professional training, and leads to the degree of Bachelor of Science (B.S.). Except for a choice between French and German, the work of the freshman year consists of definitely required subjects. The sophomore year introduces some freedom of election, in addition to the continuance of definite requirements, by providing a choice of elementary professional subjects in units known as "divisional elective groups." The work of the junior and senior years is, with certain restrictions, elective under the guidance of a major adviser, who is usually the head of the department in which the student receives his principal professional training.

FRESHMAN YEAR.

TABLE OF FRESHMAN SUBJECTS.

[Groups A and B of each term are required of all Freshman men: groups A and C of all Freshman women.] For details, see the following tables and the description of the courses.

First Term.

COURSE AND NUMBER.	Class Hours.	Laboratory Hours.	Credit Hours per Week.
Required Groups.			
Group A; for men and women:			
Agriculture 1	2	–	2
Chemistry 1 or 4	2	4	4
English 1	3	–	3
Modern Language (French or German)	3	–	3
Mathematics 1 (Algebra)	3	–	3
Group B; for men:			
Military 1 (or Physical Education 7)	–	3	2
Physical Education 1	1	–	1
Physical Education 2	–	2	1
Group C; for women:			
Rural Home Life 1	2	–	2
Physical Education 4	–	3	2

Second Term.

COURSE AND NUMBER.	Class Hours.	Laboratory Hours.	Credit Hours per Week.
Required Groups.			
Group A; for men and women:			
Agriculture 2	2	–	2
Chemistry 2 or 5	2	4	4
English 2	3	–	3
Modern Language (French or German)	3	–	3
Mathematics 2 (Mathematical Analysis)	3	–	3
Group B; for men:			
Military 2 (or Physical Education 8)	–	3	2
Group C; for women:			
Physical Education 5	–	3	2

Third Term.

Course and Number.	Class Hours.	Laboratory Hours.	Credit Hours per Week.
Required Groups.			
Group A; for men and women:			
Agriculture 3	2	–	2
Botany 3	2	4	4
English 3	3	–	3
Modern Language (French or German)	3	–	3
Mathematics 3 (Trigonometry)	3	–	3
Group B; for men:			
Military 3 (or Physical Education 9)	–	3	2
Physical Education 3	–	2	1
Group C; for women:			
Agriculture 6	2	–	2
Physical Education 6	–	2	1

SOPHOMORE YEAR.

Table of Sophomore Subjects.

[Groups A and B of each term are required of all Sophomore men; groups A and C, of all Sophomore women. In addition one of the "Divisional Elective Groups" is to be elected as a unit by each Sophomore. For details, see the following tables of the first, second, and third terms, and the description of the courses.]

First Term.

Course and Number.	Class Hours.	Laboratory Hours.	Credit Hours per Week.
Required Groups.			
Group A; for men and women:			
English 25	2	–	2
English 28	1	–	1
Physics 25	3	2	4
Zoölogy 26	2	4	4
Group B; for men:			
Military 25 (or Physical Education 30)	–	3	2
Physical Education 25	–	2	1
Group C; for women:			
Physical Education 27	–	5	3
Divisional Elective Groups.			
Agriculture:			
Agronomy 25	2	4	4
Animal Husbandry 25	2	2	3
Horticulture:			
Entomology 26	4	–	4
Horticulture 25	1	4	3
Landscape Gardening:			
Drawing 25	–	8	4
Horticulture 25	1	4	3
Science:			
Entomology 26	4	–	4
Modern Language (French or German)	3	–	3
Rural Social Science:			
Economics 25	5	–	5
Elective (optional)[1]	–	–	3
Rural Home Life:			
Physiology 33	2	2	3
Rural Home Life 28	1	6	4

[1] To be chosen from freshman and sophomore courses.

Second Term.

COURSE AND NUMBER.	Class Hours.	Laboratory Hours.	Credit Hours per Week.
Required Groups.			
Group A; for men and women:			
Botany 25	1	4	3
English 26	2	–	2
English 29	1	–	1
Group B; for men:			
Military 26 (or Physical Education 31)	–	3	2
Group C; for women:			
Physical Education 28	–	3	2
Divisional Elective Groups.			
Agriculture:			
Animal Husbandry 26	2	2	3
Chemistry 30	3	4	5
Physics 26	3	2	4
Horticulture:			
Agricultural Economics 26	4	2	5
Horticulture 26	1	4	3
Chemistry 25	2	4	4
or			
Physics 26	3	2	4
Landscape Gardening:			
Drawing 26	–	6	3
Horticulture 26	1	4	3
Mathematics 26	3	–	3
Physics 26	3	2	4
Science:			
Chemistry 25	2	4	4
Modern Language (French or German)	3	–	3
Physics 26	3	2	4
Rural Social Science:			
Agricultural Economics 26	4	2	5
Agricultural Education 29	3	–	3
History and Government 25	3	–	3
Elective (optional)[1]	–	–	3
Rural Home Life:			
Chemistry 30	3	4	5
Drawing 30	–	6	3
Rural Home Life 29	1	6	4

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[1] To be chosen from freshman and sophomore courses.

Third Term.

Course and Number.	Class Hours.	Laboratory Hours.	Credit Hours per Week.
Required Groups.			
Group A; for men and women:			
English 27	2	–	2
Group B; for men:			
Military 27 (or Physical Education 32)	–	3	2
Physical Education 26	–	2	1
Group C; for women:			
Physical Education 29	–	5	3
Divisional Elective Groups.			
Agriculture:			
Agricultural Engineering 27	–	4	2
Agricultural Engineering 30	–	8	4
or			
Physics 27	3	2	4
Agronomy 27	3	2	4
English 30	1	–	1
History and Government 27	2	–	2
Horticulture:			
Agricultural Engineering 30	–	8	4
Agronomy 27	3	2	4
English 30	1	–	1
History and Government 27	2	–	2
Horticulture 27	5	–	5
Landscape Gardening:			
Drawing 27	–	8	4
English 30	1	–	1
History and Government 27	2	–	2
Horticulture 27	5	–	5
Mathematics 27	–	6	3
Science:[1]			
Botany 26	1	6	4
Chemistry 26	1	4	3
Entomology 28	–	6	3
Modern Language (French or German)	3	–	3
Physics 27	3	2	4
Rural Social Science:			
English 30	1	–	1
History and Government 27	2	–	2
Rural Sociology 27	3	–	3
Elective[2]	–	–	8–11
Rural Home Life:			
Agricultural Engineering 33	2	4	4
English 30	1	–	1
History and Government 27	2	–	2
Rural Home Life 32	–	6	3

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[1] Three sciences to be elected.

[2] To be chosen from freshman and sophomore courses.

MAJORS: JUNIOR AND SENIOR YEARS.

GENERAL STATEMENT.

A major consists of 60 credit hours of correlated work, which is arranged by the student and his adviser.

The list of courses found under each major on subsequent pages should not be considered as necessarily a rigid program to be followed. The heads of departments have suggested this series of courses as the best for the average student majoring in their departments. Advisers may, however, make modifications to suit the particular needs of the student, provided these modifications conform precisely to the class schedule as published for the year.

RULES GOVERNING MAJORS.

RULE 1. *Election.* — Each student, before the first term of his junior year, shall elect a major subject from the list of majors given below; and this major shall consist of 60 credit hours of correlated work.

RULE 2. *Minimum Credits.* — The minimum number of credits for graduation shall be 120 junior-senior credit hours in addition to the satisfactory completion of the required courses of the freshman year and of the required and elective groups of the sophomore year.

RULE 3. *Maximum Credits.* — The maximum number of credits for any term of the junior or senior year shall be 22; the minimum shall be 18.

RULE 4. *Humanities and Rural Social Science.* — A minimum of 18 credit hours in the Divisions of the Humanities and Rural Social Science will be required of all students during their junior and senior years, with the following restriction: a minimum of 5 credit hours will be required in each of the divisions.

RULE 5. *Advisers.* — The work of each junior and senior will be under the immediate supervision of an instructor designated as major adviser. Ordinarily, the major adviser will be the head of the department in which the student elects his major. The adviser has full authority to prescribe the student's work up to 60 hours. He will, however, so far as practicable, recognize the individual needs of the student. It is also expected that students will seek the counsel of the adviser with respect to the remaining courses required for graduation.

RULE 6. *Free Electives.* — Each student during his junior and senior years is required to take 60 hours in his major and also 18 hours in the Divisions of the Humanities and Rural Social Science, making a total of 78 hours (but see Rule 4). He is allowed free choice of courses to complete his required hours.

RULE 7. *Registration.* — No junior or senior shall register until his major course of study is approved by his adviser.

(1) Course cards for recording the election of majors will be issued from the Schedule Room five weeks before the close of each term.

(2) This card must be submitted by each student to his major adviser, who will lay out the course for the succeeding term and countersign the card.

(3) Each course card must be filled out, giving the name of student, his major, his class and the name and address of parent or guardian. When the major courses have been entered on this card, and the hours of free elections added by the student, the card, accompanied by one hour plan, must be returned to the Schedule Room two weeks before the beginning of the final examination period.

RULE 8. *Change of Major.* — Applications for change of major may be made to the Dean in writing at any time; when approved by both major advisers concerned and by the Dean and the committee on scholarship, the change becomes operative at the beginning of the term following, provided that no change in the selection of a major may be made by any student after registration day of his senior year.

MAJOR GROUPS.

The arabic figure following the name and catalog number of each course represents the credit hours.

ANIMAL HUSBANDRY. Professor JULIUS H. FRANDSEN, *Adviser.*

YEAR.	Term I.		Term II.		Term III.	
Junior	Animal Husbandry 50 Dairy 50	3 5	Agronomy 50 Animal Husbandry 54 Farm Management 51 Veterinary Science 50	3 3 3 5	Agronomy 51[1] Animal Husbandry 52 Animal Husbandry 53 Dairying 52[1]	3 3 3 5
Senior	Agricultural Engineering 75[1] Animal Husbandry 75 Farm Management 76 Veterinary Science 75 or 78	5 3 3 5 or 3	Agricultural Engineering 78[1] Agronomy 77[1] Animal Husbandry 76 Animal Husbandry 81 Veterinary Science 76 or 79	5 5 3 1 5 or 3	Agronomy 51[1] Animal Husbandry 77 Animal Husbandry 80 Animal Husbandry 82 Farm Management 81[1] Poultry 78[1] Veterinary Science 77 or 80	3 3 3 1 2 5 5 or 3

[1] Suggested but not required.

DAIRY MANUFACTURES. Professor JULIUS H. FRANDSEN, *Adviser.*

YEAR.	Term I.		Term II.		Term III.	
Junior	Agricultural Education 51[1] Animal Husbandry 50 Dairying 50 Dairying 75 Dairying 76 Dairying 79	5 3 5 3 4 1	Chemistry 25 Dairying 51 Dairying 77 Economics 51[1] Microbiology 51 Rural Sociology 51[1] Veterinary Science 50[1]	4 1 5 5 5 3 5	Agricultural Engineering 81[1] Dairying 52 Dairying 53 Dairying 78 Dairying 80 Economics 52[1]	3 5 2 5 1 5
Senior	Agricultural Economics 83[1] Bacteriology 80 Chemistry 61 Dairying 75 Dairying 76 Dairying 79	2 3 5 3 4 1	Agricultural Economics 75[1] Agricultural Economics 76 Animal Husbandry 81 Chemistry 81 Dairying 77 Farm Management 51[1]	5 5 1 5 5 3	Agricultural Economics 53 Agricultural Economics 84[1] Dairying 78 Dairying 80	5 2 5 1

[1] Suggested but not required.

FARM MANAGEMENT. Professor JAMES A. FOORD, *Adviser.*

YEAR.	Term I.		Term II.		Term III.	
Junior	Animal Husbandry 50 Dairying 50 Pomology 50	3 5 3	Agronomy 50 Farm Management 51 Pomology 51	3 3 3	Agronomy 51[1] Animal Husbandry 52[1] Animal Husbandry 53 Dairying 52[1] Forestry 58	3 3 3 5 3
Senior	Agricultural Engineering 75 Animal Husbandry 75[1] Farm Management 76 Veterinary Science 75	5 3 3 5	Agricultural Engineering 78 Agronomy 77 Animal Husbandry 76[1] Farm Management 78	5 5 3 1	Agricultural Engineering 79 Agronomy 51[1] Animal Husbandry 77 Farm Management 77 Farm Management 79 Farm Management 81[1] Pomology 78[1] Poultry 78[1]	5 3 3 3 1 2 3 5

[1] Suggested but not required.

POULTRY HUSBANDRY. Professor JOHN C. GRAHAM, *Adviser.*

YEAR.	Term I.	Term II.	Term III.
Junior	Agricultural Education 52[1] 5 Agricultural Engineering 75[1] 5 Poultry 50 5	Agricultural Education 55[1] 5 Farm Management 51[1] 3 Poultry 51 5 Zoölogy 76[1] 3	Agricultural Economics 53 5 Agricultural Engineering 30[1] 4 Poultry 52 5 Vegetable Gardening 50[1] 5
Senior	Farm Management 76[1] 3 Poultry 75 3 Poultry 76 4 Veterinary Science 78 or 85 3	Agricultural Economics 52[1] 5 Poultry 77 5 Veterinary Science 79 or 86 3	Poultry 79 4 Veterinary Science 80 or 87 3

[1] Suggested but not required.

FLORICULTURE. Professor CLARK L. THAYER, *Adviser.*

YEAR.	Term I.	Term II.	Term III.
Junior	Botany 50 2 Entomology 50 3 Floriculture 50 4 Floriculture 53 4	Botany 51 2 Floriculture 51 4	Floriculture 52 4 Floriculture 55 3
Senior	Agricultural Economics 83 2 Floriculture 75 3 Horticulture 50 5 Landscape Gardening 75 3	Floriculture 76 3 Floriculture 79 3	Agricultural Economics 84 2 Floriculture 77 3 Floriculture 80 2–3 Horticulture 51 5 Horticulture 75 2

ADVISED. — The department advises all students who major in this subject to take Botany 78, 79 and 80, and Agricultural Economics 53.

LANDSCAPE GARDENING. Professor FRANK A. WAUGH, *Adviser.*

YEAR.	Term I.	Term II.	Term III.
Junior	Horticulture 50 5 Landscape Gardening 50 5 Landscape Gardening 78 or 79 3	Landscape Gardening 51 4	Floriculture 55 3 Horticulture 51 5 Landscape Gardening 52 5
Senior	Landscape Gardening 75 3 Landscape Gardening 76 4 Landscape Gardening 78 or 79 3	Landscape Gardening 80 4 Landscape Gardening 81 4	Horticulture 75 2 Landscape Gardening 77 4 Landscape Gardening 82 4

POMOLOGY. Professor FRED C. SEARS, *Adviser.*

YEAR.	Term I.	Term II.	Term III.
Junior	Botany 50 2–6 Entomology 50 3 Pomology 50 3	Pomology 51 3 Pomology 54 3	Agricultural Economics 53 5 Pomology 52 3
Senior	Horticultural Manufactures 75 5 Pomology 75 3 Pomology 77 3 Pomology 80 1	Agronomy 77 5 Horticultural Manufactures 76 3 Pomology 76 3 Pomology 81 1	Agricultural Engineering 78 5 Horticultural Manufactures 77 2 Horticulture 75 2 Pomology 78 3 Pomology 82 1

Vegetable Gardening. Professor Frank A. Waugh, *Adviser*.

Year.	Term I.		Term II.		Term III.	
Junior	Agronomy 75	5	Botany 51	2	Agricultural Economics 53	5
	Botany 50	2	Vegetable Gardening 52	5	Vegetable Gardening 53	5
Senior	Agronomy 75	5	Horticultural Manufactures 76	3	Horticulture 75	2
	Floriculture 53	4	Vegetable Gardening 76	5	Vegetable Gardening 77	5
	Horticultural Manufactures 75	5				
	Vegetable Gardening 75	5				

Economic Botany. Professor A. Vincent Osmun, *Adviser*.

Year.	Term I.		Term II.		Term III.	
Junior	Botany 52	3	Botany 53	3	Botany 54 or	3
	Botany 58 or 61	3	Botany 59 or 62	3	Botany 60 or 63	3
	Chemistry 51	6	Chemistry 52	6	Botany 55	5
	French or German 50	3	French or German 51	3	French or German 52	3
Senior	Botany 58 or 61	3	Botany 59 or 62	3	Botany 60 or 63	3
	Botany 75 or	5	Botany 76 or	5	Botany 77 or	5
	Botany 78	5	Botany 79	3 or 5	Botany 80	3 or 5

Agricultural Chemistry. Professor Charles A. Peters, *Adviser*.

Year.	Term I.		Term II.		Term III.	
Junior	Chemistry 51	6	Chemistry 52	6	Chemistry 53	6
	Chemistry 61	5	Chemistry 62	6	Chemistry 63	5
Senior	Chemistry 75	6	Chemistry 86	3	Chemistry 87	3
	Chemistry 80	5	Chemistry 90, 92, 94, 96[1]	5	Chemistry 91, 93, 95, 97[1]	5

Note. — A knowledge of German is required. Students having had no German previously should elect it at the beginning of the sophomore year.

[1] Students will select one course from groups 90, 92, 94, 96 and 91, 93, 95, 97 respectively.

Economic Entomology. Professor Henry T. Fernald, *Adviser*.

Year.	Term I.		Term II.		Term III.	
Junior	Chemistry 51[1]	6	Botany 51	3	Chemistry 53[1]	6
	Entomology 52	2	Chemistry 52[1]	6	Entomology 57	2
	Entomology 53	5	Entomology 55	4	Entomology 65	3
	French or German 50[1]	3	Entomology 56	3	Entomology 75	4
			French or German 51[1]	3	French or German 52[1]	3
Senior	Chemistry 80	5	Entomology 77	3	Entomology 78	4
	Entomology 76	5	Entomology 90	3	Geology 52	3
	Entomology 79	3	Pomology 79[1]	3	Horticulture 51[1]	5
	Entomology 85[1]	3	Zoölogy 76	3	Pomology 78[1]	3
	Horticulture 50[1]	5				
	Zoölogy 53	3				

[1] Suggested but not required.

AGRICULTURAL ECONOMICS. Professor ALEXANDER E. CANCE, *Adviser.*

YEAR.	Term I.		Term II.		Term III.	
Junior .	Agricultural Economics 50 .	5	Agricultural Economics 52 .	5	Agricultural Economics 53	5
	Agricultural Education 55 .	5	Economics 51 . . .	5	Economics 52 . . .	5
	English 65	3	Rural Sociology 51[1] . .	3	Rural Sociology 52[1] .	3
Senior .	Agricultural Economics 77 .	5	Agricultural Economics 75 .	5	Agricultural Economics 78	3
	Agricultural Economics 79 .	5	Agricultural Economics 76 .	5	Agricultural Economics 87	3

[1] Suggested but not required.

AGRICULTURAL EDUCATION. Professor WINTHROP S. WELLES, *Adviser.*

YEAR.	Term I.		Term II.		Term III.	
Junior .	Agricultural Education 51 .	5	Agricultural Education 51 .	5	Agricultural Education 56	5
	Agricultural Education 55 .	5	Agricultural Education 55 .	5		
			Agricultural Education 56 .	5		
Senior .	Agricultural Education 52 .	5	Agricultural Education 75 .	3	Agricultural Education 76	5
	Agricultural Education 76 .	5	Agricultural Education 80	1–5	Agricultural Education 77	3
	Agricultural Education 80	1–5	Agricultural Education 95 .	3	Agricultural Education 79	3
	Agricultural Education 85 .	3			Agricultural Education 80	1–5
					Agricultural Education 81	2
					Agricultural Education 83	2

COURSES IN EDUCATION ADVISED. — (*a*) For general teaching program six of the following courses: 51, 52, 55, 56, 75, 79, 80, 95. (*b*) For vocational agricultural teaching 51, 56 or 75, 76, 80. (*c*) For extension teaching 51, 56, 76, 77, 80.

RURAL HOME LIFE. Professor EDNA L. SKINNER, *Adviser.*

YEAR.	Term I.		Term II.		Term III.	
Junior .	Chemistry 80[1]	5	Agricultural Education 55 or 56	5	Rural Home Life 52 .	5
	Economics 50	5	Rural Home Life 51 . .	5	Rural Sociology 27 . .	3
	Rural Home Life 50 . .	5	Rural Home Life 56 . .	5		
Senior .	Horticultural Manufactures 80	4	Agricultural Engineering 53	4	Rural Home Life 61 .	5
	Rural Home Life 76 . .	5	Rural Home Life 78 . .	3	Rural Home Life 83 .	3
	Rural Home Life 81 . .	3	Rural Home Life 82 . .	3		

[1] Suggested but not required.

DESCRIPTION OF COURSES.

DIVISION OF AGRICULTURE.

[Heavy-faced Roman numerals indicate the term in which the course is given. Numbering of courses, 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive: seniors.]

Agriculture.

1. **I.** 2. **II.** 3. **III.** AGRICULTURE. — Required course for all freshmen. A survey course, tracing the development of man as influenced by agriculture. It considers those problems which our complicated present-day civilization looks to agriculture to solve — problems practical, scientific, commercial, sociological. The object of the course is to give to students the agricultural concept, and an appreciation of the close relationship of all lines of human activity to the great problems of agriculture.
2 class hours. Credit, 2.
Assistant Professor LANPHEAR.

6. **III.** AGRICULTURAL OPPORTUNITIES FOR WOMEN. — For freshman women. Designed to show the woman who is interested in agriculture what opportunities there are for her in that field, and how she may best take advantage of them. The types of agricultural work for which women are best adapted are discussed. A study is made of some of the special problems which confront the woman farmer, and her best ways of solving them.
2 class hours. Credit, 2.
Miss HAMLIN.

Agricultural Engineering.

Professor GUNNESS, Assistant Professor MARKUSON, Mr. PUSHEE, Mr. NEWLON.

The courses in agricultural engineering are planned to give a working knowledge of those phases of engineering which apply directly to the farm. It is expected that the student will acquire a clear understanding of modern farm practice as it relates to permanent improvements of the farm and the farmstead, and in the selection and use of farm equipment.

Required Courses.

27. **III.** MECHANICAL DRAWING. — For sophomores; juniors and seniors may elect. The exercises include lettering, geometric construction, orthographic projection, isometric drawing, and the making of working drawings of simple farm equipment. This course is for the agricultural student who wishes to learn the use of drawing instruments, the reading of blue prints, and some of the general practices of drafting valuable to every agriculturist. Students who contemplate taking Agricultural Engineering 75 will find this course helpful.
2 2-hour laboratory periods, credit, 2.
Assistant Professor MARKUSON.

30. **III.** SHOP PRACTICE. — For sophomores; juniors and seniors may elect. Practice is given in the use of carpentry tools by exercises in bench work, repair of farm equipment, and farm building construction. Exercises in forge work, pipe fitting, soldering, babbitting and fitting bearings, lining up shafting, lacing belts,

and splicing rope. Practice in the use of machinists' tools, such as file, cold chisel, drill press, lathe, taps and dies.

4 2-hour laboratory periods, credit, 4.
Messrs. PUSHEE and NEWLON.

33. **III.** MECHANICS OF THE HOUSEHOLD. — For sophomores. A study of mechanics in their relation to the household, including heat, light, electricity, and the testing, care, and maintenance of household equipment and appliances.

2 class hours. 2 2-hour laboratory periods, credit, 4.
The DEPARTMENT.

Elective Courses.

53. **II.** HOUSE PLANNING AND CONSTRUCTION. — For juniors; seniors may elect. Plan designs of the small house will be made. The arrangement of interior equipment, especially in the kitchen; lighting; heating; water supply; and sewage disposal will be studied, together with a brief history of the house, materials, construction methods, equipment, and architectural styles. Consideration will be given to the economics of house building, including financing, and to maintenance and overhead expense.

2 class hours. 2 2-hour laboratory periods, credit, 4.
Assistant Professor MARKUSON.

75. **I.** FARM STRUCTURES. — For seniors; juniors may elect. A study of the strength and durability of concrete, wood, stone, and clay products, and of the mechanical principles underlying their use in farm construction. The design of various farm buildings, such as the general purpose barn, dairy stable, hog house, sheep barn, milk house, etc. In the drafting room, details of construction will be worked out, a study of the mechanics of simple roof trusses will be made, and a complete design of some major farm building will be finished in all essential details. Blueprints of the finished design will be made.

2 class hours. 3 2-hour laboratory periods, credit, 5.
Assistant Professor MARKUSON.

78. **II** and **III.** FARM MOTORS. — For seniors; juniors may elect. This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. The theory of the internal combustion engine is taken up in order to emphasize the effect of design and operation on power and economy. The various types of carburetors, ignition, and lubrication systems are studied in detail. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles and tractors. Special attention is given to overhauling and repairing.

3 class hours. 2 2-hour laboratory periods, credit, 5.
Professor GUNNESS and Mr. PUSHEE.

79. **III.** DRAINAGE AND IRRIGATION ENGINEERING. — For seniors; juniors may elect. The course covers the engineering phase of drainage and irrigation. The various systems are studied, and practice is given in the design of drainage and irrigation systems. Field work gives practice in surveying for drains, platting, locating drains, erecting batterboards, and laying tile. Practice is given in assembling equipment for spray irrigation, and the flow of water through nozzles is studied by means of laboratory tests.

2 class hours. 2 3-hour laboratory periods, credit, 5.
Assistant Professor MARKUSON.

81. **III.** DAIRY MECHANICS. — For juniors; seniors may elect. A study of dairy machinery, including steam boilers, engines, pumps, traps, refrigeration machinery, and heat-controlling devices. Practice is given in pipe fitting, packing valves, lacing belts, and similar repair jobs on the equipment used in dairy plants.

2 class hours. 1 2-hour laboratory period, credit, 3.
Professor GUNNESS and Mr. NEWLON.

Agronomy.

Professor Beaumont, Assistant Professor Cubbon, Mr. Thayer.

The courses in agronomy are designed to give instruction concerning the basic knowledge of the soil and its management, fertilizers and their use, and the principal products of the field. An important objective of our undergraduate teaching is to give supporting training to groups specializing in other departments. For undergraduates desiring to specialize in agronomy adequate courses are offered, but for those expecting to go into advanced educational or research work our graduate training is recommended as preferable.

Required Courses.

25. **I.** Field Crop Production. — For sophomores. This is an introductory course designed to acquaint the student with the most important field crops, methods of production, and problems arising in their culture. Corn, forage crops, small grains, root and tuber crops, and other field crops of less importance will be studied.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Assistant Professor Cubbon.

27. **III.** Soil Management. — For sophomores. This introductory course covers in a general way the whole subject of soil management, including a study of soils and their properties, classification, management, methods of improvement, and maintenance of fertility. The use of manures, fertilizers, and soil amendments will be given as much attention as time allows. Elementary training in the natural sciences is necessary for a proper appreciation of this course.
3 class hours. 1 2-hour laboratory period, credit, 4.
Assistant Professor Cubbon.

Elective Courses.

50. **II.** Crop Production for Dairy and Stock Farms. — For juniors; seniors may elect. An intensive study of methods and problems of production of those field crops of greatest importance in the successful management of New England dairy and stock farms. Special attention will be given to the conditions found on the Massachusetts general farm on which dairying and stock-raising are important.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor Cubbon.
Prerequisite, Agronomy 27.

51. **III.** Advanced Field Crops (1928–29). — For juniors and seniors. This course is designed primarily for those specializing in field crops. Studies begun in Course 50 will be continued and extended to crops of importance beyond the range of New England. Theory and practice of crop improvement by plant breeding will be given attention. Given in alternate years.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor Cubbon.
Prerequisite, Agronomy 50.

75. **I.** Advanced Soils (1927–28). — For juniors and seniors. A continuation of studies begun in Agronomy 27, with special emphasis on soil classification and land utilization. Problems arising in the management of extreme soil types, and specific problems of moisture control and tillage will be given special consideration. Given in alternate years.
2 class hours. 1 4-hour and 1 2-hour laboratory period, credit, 5.
Assistant Professor Cubbon.
Prerequisite, Agronomy 27.

77. **II.** MANURES, FERTILIZERS, AND SOIL AMENDMENTS. — For juniors and seniors. An advanced course in which are studied manures, fertilizers, and other materials applied to the soil for crop nutrition; experimental work bearing on soil fertility and plant nutrition; and theory and practice concerning the use of manures, fertilizers, and lime.
3 class hours. 2 2-hour laboratory periods, credit, 5.
The DEPARTMENT.

Prerequisite, Agronomy 27; advised, Chemistry 61.

Animal and Dairy Husbandry.

Professor FRANDSEN, Assistant Professor RICE, Assistant Professor GLATFELTER, Assistant Professor MACK, Mr. LINDQUIST.

ANIMAL HUSBANDRY.

The courses in animal husbandry are offered to meet the needs of students interested in the various phases of live-stock farming and market-milk production; agricultural college teaching; high and secondary school teaching; federal, state, railroad, bank, or breed extension services; federal or state experiment station service; meat-packing industry; commercial feed industry.

Required Courses.

25. **I.** DAIRY BREEDS. — For sophomores in the Division of Agriculture; juniors and seniors may elect. This course includes a survey of the dairy industry. The origin, history, development, and characteristics of the dairy breeds, and their adaptability to New England conditions are studied. Preliminary work in scoring animals according to the recognized standards is given, followed by comparative judging and placing.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professors FRANDSEN and RICE.

26. **II.** HORSES, SWINE, SHEEP, AND BEEF CATTLE. — For sophomores in the Division of Agriculture; juniors and seniors may elect. In this course consideration is given to the origin, history, development, and characteristics of the breeds of horses, swine, sheep, and beef cattle. Types, market classes, and grades of live stock are studied, together with their economic importance to the country in general, and Massachusetts in particular. Preliminary work is given in scoring each type of animal, followed by judging and placing of groups. Textbooks, Vaughan's *Types and Market Classes of Live Stock;* Plumb's *Types and Breeds of Farm Animals.*
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor GLATFELTER.

Elective Courses.

29. **III.** SURVEY AND JUDGING OF LIVE STOCK. — For sophomores; juniors and seniors may elect. This course includes a survey of the live-stock industry. The origin, history, development, characteristics, distribution, and adaptability of each important breed of dairy cattle, beef cattle, sheep, swine, and horses are studied. Preliminary work in the scoring of pure-bred animals according to recognized standards is given, which is followed by considerable practice in judging and placing classes of live stock. This course is especially arranged for students enrolled in the Division of Rural Social Science and for others feeling a need for a general animal husbandry course.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor GLATFELTER.

50. **I.** THE NUTRITION OF FARM ANIMALS. — For juniors; seniors may elect. This course consists of a study and application of the principles of physiological

chemistry to the practical problems of animal feeding and growth. Consideration will be given to the chemical composition of plant and animal life; physiology of digestion; functions of vitamines, minerals, protein, and energy; feeding standards and their application; the composition of farm crops, their by-products, and commercially mixed feeds, and their utilization for the economical production of live stock and their products.

3 class hours. Credit, 3.

Assistant Professor Rice.

Prerequisites, Animal Husbandry 25 and 26.

52. **III.** Advanced Live-stock Judging. — For juniors; seniors may elect. This course serves as a laboratory supplement to Animal Husbandry 53. It has three aims: (*a*) to train the student to see and evaluate differences in farm animals; (*b*) to begin the training of men who will act as judges of live stock at fairs; (*c*) to develop judging teams in both fat stock and dairy cattle to represent the college in the intercollegiate live-stock judging contest at the leading expositions. Trips will be taken each Saturday during the term to the leading herds and flocks in Massachusetts and nearby states.

1 2-hour laboratory period on Friday, and all day Saturday, credit, 3.

Assistant Professor Rice.

Prerequisites, Animal Husbandry 25 and 26.

53. **III.** The Breeding and Improvement of Farm Animals. — For juniors; seniors may elect. This course is planned to give a broad view of the rise of many types and breeds from one ancestral stock; to note the origin, value, and permanence of certain variations; and to make clear the reasons for certain excellencies. The course also deals with the physiology of reproduction and with genetics, as a foundation for experience in actual production.

3 class hours. Credit, 3.

Assistant Professor Rice.

Prerequisites, Animal Husbandry 25 and 26; Zoölogy 26.

54. **II.** Meat and Meat Products. — For juniors; seniors may elect. This course deals with the manufacture of animals into their various commercial products and the distribution of these products to the consumer. Practice is given in the slaughtering of beef cattle, hogs, and sheep; judging of carcasses; cutting and curing of meats. The practical work is augmented by studies in the grading of fat stock, in packing house methods, in the magnitude and trends of the meat industry, and in the opportunities of local New England marketing.

1 class hour. 1 4-hour laboratory period, credit, 3.

Assistant Professors Rice and Glatfelter.

75. **I.** Dairy Cattle and Milk Production. — For seniors. Consideration is given to the application of the principles of animal nutrition to the particular problems of dairy cattle feeding. Methods of feeding for high milk production are studied. Cost of milk production, and breeding and management problems are carefully considered. A survey is made of recent experiment station results.

2 class hours. 1 2-hour laboratory period, credit, 3.

Assistant Professor Rice.

Prerequisites, Animal Husbandry 25, 50, 52, and 53.

76. **II.** Beef and Sheep Production. — For seniors. Application of the principles of nutrition is made to the feeding of beef cattle and sheep. Feeding, breeding, and management problems are considered. A survey is made of recent experiment station work, and special study is given to the opportunities for the Massachusetts farmer to produce high-quality beef and lamb.

2 class hours. 1 2-hour laboratory period, credit, 3.

Assistant Professor Glatfelter.

Prerequisites, Animal Husbandry 26, 50, 52, and 53.

77. **III.** HORSES AND SWINE PRODUCTION. — For seniors. This course is planned to familiarize students with the application of the principles of nutrition to the feeding of horses and swine. Physiological and economic factors are considered in selecting suitable feeds. Cost of production, and breeding and managerial problems in commercial horse and pork production are considered. A study is also made of recent experiment station results in feeding, breeding, and management.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor RICE.

Prerequisites, Animal Husbandry 26, 50, 52, and 53.

80. **III.** DAIRY HERD MANAGEMENT. — For seniors. The course includes a study of systems of dairy herd management; record form; methods of cost accounting; fitting for production, show and sale; cow testing and bull association work.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor FRANDSEN and Assistant Professor RICE.

81. **II.** 82. **III.** ANIMAL HUSBANDRY SEMINAR. — Required of students majoring in animal husbandry. Students will prepare original papers and talks on various pertinent topics. Round table discussions of animal husbandry investigational work and practices will be conducted. Frequent addresses will be made to the class by prominent breeders and scientists.
1 class hour. Credit, 1.
Professor FRANDSEN.

DAIRY MANUFACTURES.

The courses in dairy manufactures are offered to meet the needs of students interested in the handling of market milk, and the science and art of butter making, ice-cream making, and cheese making; agricultural college teaching, and experiment station work; high and secondary school teaching; extension work; research and investigational work.

Elective Courses.

50. **I.** GENERAL DAIRYING. — For juniors; seniors may elect. A general course, prerequisite to all other dairy courses except 51 and 53, and for those who wish to take only one course in dairying to get a general knowledge of the subject. The work covers briefly: a study of milk, its secretion, composition, and various tests applied thereto; methods of handling milk and cream; the use of separators; elements of butter making, cheese making, and ice-cream making.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Professor FRANDSEN and Mr. LINDQUIST.

51. **II.** JUDGING DAIRY PRODUCTS. — For juniors; seniors may elect. A study of standards and grades of dairy products, with practice in judging milk and ice cream, as well as butter and cheese. The student learns to recognize quality in dairy products, to detect specific defects, and to know their causes and the means of their prevention.
1 2-hour laboratory period, credit, 1.
Assistant Professor MACK.

52. **III.** MARKET MILK. — For juniors; seniors may elect. A study of the various phases of the market milk industry: sanitary production, transportation, marketing, handling in the city plant, delivery systems, milk and its relation to the public health, inspection, milk laws, food value, and advertising. Some milk plants will be visited.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Assistant Professor MACK and Mr. LINDQUIST.

Prerequisite, Dairy 50.

53. **III.** Advanced Judging of Dairy Products. — For juniors; seniors may elect. The judging of milk, ice cream, butter, and cheese, using standard commercial methods and official score cards. A team is chosen from this class to represent the college in dairy products judging contests at the Eastern States Exposition and the National Dairy Show.

2 2-hour laboratory periods, credit, 2.
The Department.
Prerequisite, Dairy 51.

75. **I.** Milk Products (1927–28). — For juniors and seniors. The manufacture of milk products other than butter and ice cream, including cheddar cheese, soft and fancy cheese, condensed and powdered milk, casein, commercial buttermilk, etc. Laboratory exercise largely in cheese making and commercial buttermilk manufacture. Given in alternate years.

1 class hour. 1 4-hour laboratory period, credit, 3.
Mr. Lindquist.
Prerequisite, Dairy 50, previously or in conjunction.

76. **I.** Advanced Testing (1928–29). — For juniors and seniors. The work covers moisture and fat testing for all dairy products; the casein test; salt test for butter; acid tests; work with the Mojonnier apparatus; and many other applied chemical tests used in dairy manufactures work. Given in alternate years.

2 4-hour laboratory periods, credit, 4.
Assistant Professor Mack.
Prerequisite, Dairy 50, previously or in conjunction.

77. **II.** Butter Making (1928–29). — For juniors and seniors. A study of separators and cream separation; handling milk and cream for butter making; preparation of starters, and ripening cream; churning; markets and their requirements; marketing, scoring and judging butter; management; butter-making machinery and care thereof; problems. Given in alternate years.

2 class hours. 2 3-hour laboratory periods, credit, 5.
The Department.
Prerequisite, Dairying 50.

78. **III.** Ice-Cream Making (1927–28). — For juniors and seniors. A study of the principles and practice of ice-cream making. The laboratory instruction will cover commercial practices. Some ice-cream plants will be visited. Given in alternate years.

2 class hours. 2 3-hour laboratory periods, credit, 5.
Assistant Professor Mack.
Prerequisite, Dairying 50.

79. **I.** 80. **III.** Seminar. — For students majoring in dairy manufactures. This course consists of a study of the work accomplished by various experiment stations, also a review of foreign literature. Students will prepare papers on various dairy subjects. Frequent addresses will be made to the class by visiting dairy authorities.

1 class hour. Credit, 1.
Professor Frandsen.

Farm Management.

Professor Foord, Assistant Professor Barrett.

The purpose of the courses in this department is to train men to manage farms and other agricultural enterprises, as well as to prepare them for research and teaching in similar lines. The work calls for a study of the cost of production and the profit from the different farm enterprises, such as dairy, poultry, or orchard; also the relative amounts of each that will give the best use of labor and equipment on any farm under consideration.

Elective Courses.

51. **II.** Farm Accounts and Cost Accounting. — For juniors; seniors may elect. A study of farm inventories, single-enterprise accounts, complete farm accounts and farm records. Special emphasis is given to the interpretation of results and their application in the organization and management of the farm.
3 2-hour laboratory periods, credit, 3.
Professor Foord.

76. **I.** Farm Management. — For seniors; juniors may elect. A study of farming as a business; regions and types of farming; the general principles of farm management and the influence of size, production, live stock and crop farming on the farmer's labor income; arrangement of fields and buildings; use of land, capital and labor; choosing and buying a farm.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Foord.
Prerequisites, Agronomy 50, Animal Husbandry 25 and 26, and some farm experience.

77. **III.** Farm Organization. — For seniors; juniors may elect. A further and more specific study of the principles and practices outlined in Course 76, with reference to their application to different regions of the United States and especially to New England. Trips to successful farms are a required part of the course.
1 class hour. 1 4-hour laboratory period, credit, 3.
Professors Foord and Barrett.
Prerequisites, Farm Management 51 and 76.

78. **II.** 79. **III.** Seminar. — For seniors majoring in general agriculture; others by arrangement.
1 class hour. Credit, 1.
Professors Foord and Barrett.

81. **III.** Farming in the United States. — For seniors. A study of the agricultural regions of the United States and the different types and methods of farming carried on in each. The economic reasons for the establishment and maintenance of each type will be considered.
2 2-hour laboratory periods, credit, 2.
The Department.
Prerequisite, Farm Management 76.

Poultry Husbandry.

Professor Graham, Professor Sanctuary, Assistant Professor Banta, Miss Pulley.

The department aims to give instruction in the science, art, and practices of poultry keeping not only to the men majoring in this department, but also to students majoring in other departments and desiring supporting courses in poultry husbandry. Our major courses prepare men for the successful operation of commercial poultry farms and marketing projects either as owners or managers; for graduate work, teaching, extension and investigational work.

Elective Courses.

50. **I.** Poultry Judging. — For juniors; seniors may elect. A study of the origin and evolution of our standard breeds and varieties of domestic fowl; judging production quality, using trapnested birds; judging exhibition quality by score card and comparison. One or more poultry farms, an egg-laying contest, and a poultry show will be visited. Poultry judging teams competing in the inter-

collegiate contest at Madison Square Garden each January are trained in this course.

2 class hours. 2 3-hour laboratory periods, credit, 5.

Assistant Professor Banta.

51. **II.** Poultry Feeds and Feeding. — For juniors; seniors may elect. A study of the common feeds and the scientific principles underlying the field of nutrition. Recent experimental work and current feeding problems will receive special consideration. For observational practice and accumulation of original data, the management of a pen of birds will be required for a period of a few weeks.

3 class hours. 2 2-hour laboratory periods, credit, 5.

Assistant Professor Banta.

52. **III.** Incubation and Brooding. — For juniors; seniors may elect. A study of the fundamental principles underlying incubation and brooding practices. The science of physics and general biology is applied to the study of incubation and brooding processes. Students become thoroughly acquainted with modern incubation and brooding equipment through detailed study and operation of typical incubators and brooders. Present-day problems are considered and some are investigated as a part of the class work.

2 class hours. 3 2-hour laboratory periods, credit, 5.

Professor Sanctuary and Miss Pulley.

75. **I.** Poultry Housing and Sanitation. — For seniors. A consideration of the biological needs of poultry from the standpoint of housing, and the economic principles governing designing and construction of poultry houses and equipment for poultry farm buildings. The course also embodies a study of the principles of poultry sanitation, including external parasites and the insecticidal agents for their control.

3 class hours. Credit, 3.

Assistant Professor Banta.

76. **I.** Market Poultry and Poultry Products. — For seniors. A study of market classes of poultry and eggs; preparation of poultry products for market; requirements of different markets; methods of marketing, involving a study of distribution, finances, and business organizations; cold storage and transportation; advertising, prices, and food values. Laboratory exercises in candling, packing, killing, dressing, and similar operations to make the above named factors more concrete. Students are required to fatten pens of chickens by different methods and rations, keeping accurate data of the gains in weight and quality, also the costs of feed and labor, and resultant profit or loss. Competitive judging of the exhibits in the Annual Market Poultry Show, staged by the members of this class, is a feature of the course. When possible, a short trip to Springfield is arranged to study cold storage plants and the handling of poultry products in the local market.

2 class hours. 2 2-hour laboratory periods, credit, 4.

Miss Pulley.

77. **II.** Poultry Breeding. — For seniors. Methods of selection and improvement of poultry are developed through the study of the principles of heredity. Most of the course centers around the progeny test and pedigree method of breeding. Students taking this course participate in the college plant selection in pedigree work. Three breeds of poultry, each pedigreed for from seven to twenty years, furnish practice materials.

4 class hours. 1 2-hour laboratory period, credit, 5.

Professor Sanctuary.

78. **III.** Farm Poultry. — For seniors; juniors may elect. For those students who desire a general knowledge of poultry husbandry but who cannot devote more than one term to the subject; it is not intended for students specializing in poultry, and such students are admitted only by special permission. Em-

phasis is placed on the farm flock and its economic management. Utility classification, housing, culling, feeding, hatching, rearing, production, marketing, and disease control receive special consideration.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Assistant Professor BANTA.

79. **III.** POULTRY FARM ORGANIZATION. — For seniors. This course embodies the application of economic and business principles to poultry farming. The place and importance of the various branches of well-organized poultry farms and their relation to each other receive special consideration; also the study of surveys and production costs. A trip covering two or three days will be made to representative successful poultry farms. The expense per student is approximately fifteen dollars. This trip is required of each student taking the course for credit.
3 class hours. 1 2-hour laboratory period, credit, 4.
Professor GRAHAM.

Prerequisite, Poultry 77.

DIVISION OF HORTICULTURE.

Professor WAUGH.

[Heavy-faced Roman numerals indicate the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

Floriculture.

Professor THAYER, Assistant Professor MULLER.

The courses in floriculture are intended to present a general knowledge of all phases of greenhouse design, construction, heating, and management, the culture of florists' crops (under glass and outdoors), floral decoration and arrangement, and the marketing of plants and flowers. The department aims to train students so that they may take up various phases of commercial floriculture, positions in nursery establishments, and the management of conservatories on private estates, in parks and cemeteries.

Elective Courses.

50. **I.** GREENHOUSE MANAGEMENT. — For juniors; seniors may elect. Designed to familiarize students with the methods followed in the management of greenhouses and greenhouse crops, and the principles underlying the same; history and development of the floricultural industry; preparation of soils; fertilizers; potting; watering; ventilation; control of insects and diseases; methods of plant propagation; forcing of plants. At some time during the term the members of the class will be required to take a one-day trip to visit large commercial establishments. Lectures, assigned readings, reports, and laboratory practice.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Assistant Professor MULLER.

Prerequisite, Horticulture 25, 26, and 27.

51. **II.** GREENHOUSE MANAGEMENT. — For juniors; seniors may elect. Continuation of Course 50. Several field trips, to study floricultural establishments in the vicinity, will be made during the laboratory periods.
2 class hours. 1 4-hour laboratory period, credit, 4.
Assistant Professor MULLER.

Prerequisite, Floriculture 50.

52. **III.** FLORAL ARRANGEMENT. — For juniors; seniors may elect. A study of the principles underlying the arrangement and use of cut flowers and plants; funeral designs, basket and vase arrangement, table decorations, home, church,

and all interior decorations; a study of color as applied to such work. Lectures, assigned readings, and reports. This course is limited to ten students.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Professor Thayer.

53. **I.** Greenhouse Construction and Heating. — For juniors; seniors may elect. The location, types, arrangement, construction, cost, equipment, heating and ventilating of greenhouse structures; the drawing of plans and study of specifications for commercial houses and conservatory ranges. Such practical work as glazing and the construction of concrete benches and cold frames is included as facilities allow. Lectures, assigned readings, and problems.
3 class hours. 1 2-hour laboratory period, credit, 4.
Professor Thayer.

55. **III.** Garden Flowers and Bedding Plants. — For juniors and seniors. A study of the annuals, biennials, herbaceous perennials, bulbs, bedding plants, and roses that are valuable for use in floricultural or landscape gardening work. Methods of propagation, culture and uses of the various plants are considered; identification of material. Lectures, assigned readings, and reports.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professors Thayer and Muller.

75. **I.** 76. **II.** Commercial Floriculture. — For seniors. A detailed study of the cultural methods for the important commercial cut-flower crops and potted plants. Visits will be made to commercial establishments during the courses. The lectures are supplemented with textbooks and assigned readings.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Thayer.
Prerequisite, Floriculture 51.

77. **III.** Commercial Floriculture. — For seniors. The marketing of flowers and plants, including the management of wholesale markets and retail flower stores; a study of systems of record keeping, cost analysis, inventory methods, and other phases of this important part of the floricultural industry.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor Muller.
Prerequisite, Floriculture 76.

79. **II.** Conservatory Plants. — For seniors. A study of the foliage and flowering plants used in conservatory work; methods of propagation, culture, use and arrangement; identification of plants. Lectures, assigned readings, and reports.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Thayer.

80. **III.** Seminar. — For seniors majoring in floriculture. Advanced study of subjects pertaining to some phase of floriculture. All students are assigned specific problems and pursue study in these problems by reading and research. The results of this study must be presented in the form of a thesis. Seminars are conducted weekly.
1 class hour. 2 to 4 laboratory hours, not to exceed 3 credits.
Professor Thayer.

Forestry.

Professor Grose.

The forestry courses are intended primarily for prospective owners or managers of farm woodlots, and the field work is focused on typical New England problems. These courses are broad enough, however, to furnish valuable preparation for students planning to study forestry in graduate schools.

55. **I.** Woodlot Forestry: Estimating and Business Management. — For juniors and seniors. Topics: forest mapping; timber-cruising; determining rate of growth and possible cut; financial returns; forest taxation; our national timber supply, present and future.

1 2-hour and 1 4-hour laboratory period, credit, 3.
Professor Grose.

56. **II.** Woodlot Forestry: Logging, Milling, and Marketing. — For juniors and seniors. Topics: felling trees; sawing logs; hauling logs; the portable mill; the stationary mill; seasoning, measuring, and shipping lumber; lumber grades and prices; legal forms; by-products of the woodlot; adaptability of species to uses; wood-using industries of Massachusetts.

2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Grose.

Prerequisite, Forestry 55.

57. **III.** Woodlot Forestry: Timber-raising. — For juniors and seniors. Topics: forest planting; weeding; release cuttings; pruning; thinning; salvage cutting; protection from insects, fungi, fire, etc.; final cutting methods for natural reproduction of the forest.

1 2-hour and 1 4-hour laboratory period, credit, 3.
Professor Grose.

58. **III.** Woodlot Forestry: Brief Survey. — For juniors and seniors. A condensation of Courses 55, 56, and 57 for those who have only one term to give to forestry.

2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Grose.

Horticultural Manufactures.

Professor Chenoweth, Mr. Cartwright.

The courses aim to give a knowledge of the practical problems connected with food preservation, with some skill in the manipulation of materials and equipment, together with a clear understanding of the scientific principles involved. Emphasis is placed upon the conservation of the cheaper grades of fruits and vegetables to the end that the entire crop may be marketed and that wholesome food may be produced from materials that would otherwise be lost. The social and economic values of this type of work and its relations to modern methods of living are emphasized.

Elective Courses.

75. **I.** Horticultural Manufactures. — For seniors and graduate students. A practical course in food preservation dealing primarily with fruits and vegetables. The canning of fruits and vegetables as practiced in the home and in commercial canneries. The manufacture of (*a*) fruit products, such as butters, jams, jellies, juices, marmalades, vinegars, etc., and (*b*) vegetable products, such as pickles, piccalilli, sauerkraut, etc. Particular attention is given to the study and use of all types of equipment suitable for the home or small factory, together with methods for testing and judging a large variety of manufactured products.

2 class hours. 3 2-hour laboratory periods, credit, 5.
Professor Chenoweth.

76. **II.** Horticultural Manufactures. — For seniors and graduate students. A continuation of Course 75. Emphasis is placed on the preservation of small fruits. A comparison of relative values of different varieties of small fruits for canning and manufacturing purposes. Judging of canned and manufactured

fruit and vegetable products, together with a study of commercial grades and standards of canned foods.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professor CHENOWETH.

Prerequisite, Horticultural Manufactures 75.

77. **III.** HORTICULTURAL MANUFACTURES. — For seniors and graduate students. A continuation of Courses 75 and 76, dealing primarily with maple products and the canning of meats and the early spring vegetables. Also a study of special problems involved in establishing and operating home and farm factories. Visits to near by farm factories and salting stations are required of all students.
2 2-hour laboratory periods, credit, 2.
Professor CHENOWETH.

Prerequisites, Horticultural Manufactures 75 and 76.

78. **III.** HORTICULTURAL MANUFACTURES. — For seniors and graduate students. Intended for the student who desires a broad, general knowledge of food preservation. A general course in food preservation, including lectures, readings, and laboratory exercises in the canning and drying of fruits and vegetables, and the manufacture of fruit and vegetable products. Emphasis is placed on the conservation of the low grades of fruits and vegetables in the home and the home factory.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Professor CHENOWETH and Mr. CARTWRIGHT.

80. **I.** HORTICULTURAL MANUFACTURES. — For junior and senior women. A course dealing with the problems of food preservation in the home. Application of present-day knowledge is made to the practices of canning, pickling, and manufacturing the autumn fruit and vegetable products.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Professor CHENOWETH and Mr. CARTWRIGHT.

81. **II.** HORTICULTURAL MANUFACTURES. — For junior and senior women. A continuation of Course 80. The preservation of small fruits and the home storage of fruits and vegetables. The use of salt in the home preservation of vegetables, the manufacture of pickles, and the canning of meats and poultry will constitute the main work in this course.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professor CHENOWETH and Mr. CARTWRIGHT.

Prerequisite, Horticultural Manufactures 80.

Horticulture.

Professor WAUGH, Professor THOMPSON, Assistant Professor DRAIN, Mr. FRENCH.

The general subject of horticulture divides naturally into subjects of pomology, floriculture, forestry, landscape gardening, and vegetable gardening. A number of courses relate to more than one of these subjects, and are therefore grouped here under the general designation of horticulture.

Required Courses.

25. **I.** RELATIONSHIPS AND ASSOCIATIONS OF HORTICULTURAL PLANTS. — For sophomores. A study of the outstanding characters utilized in acquiring a practical knowledge of the principal species and varieties of cultivated plants, together with a consideration of those principles which determine the natural associations of plants in so far as they bear on the best methods of plant culture.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professor THOMPSON.

26. **II.** HORTICULTURAL PRACTICES. — For sophomores. This course is designed to demonstrate and explain the principles underlying the practical cultivation of economic plants. Consideration will be given to the methods of propagation and to the culture of plants in their relation to soils, tillage, water, food supply, etc.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Assistant Professor DRAIN.

27. **III.** BREEDING OF HORTICULTURAL PLANTS. — For sophomores. A study of the principles of inheritance as applied to plants, together with a consideration of the methods used and problems involved in the improvement of horticultural crops.
5 class hours. Credit, 5.
Mr. FRENCH.

Elective Courses.

50. **I.** PLANT MATERIALS. — For juniors; seniors may elect. The course aims to make the student familiar with the distinguishing characters of trees, shrubs, and woody vines used in ornamental plantings, together with the propagation and care of the same.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Professor THOMPSON.

51. **III.** PLANT MATERIALS. — For juniors; seniors may elect. A continuation of Course 50, taking up the field uses of trees, shrubs, and woody climbers, their natural habitats, soils, and plant associations, with a view to supplying to the students in landscape gardening and floriculture a knowledge of the species and varieties used in ornamental planting. Frequent practicums and field excursions.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Professor THOMPSON.
Prerequisite, Horticulture 50.

75. **III.** HORTICULTURE REVIEW. — Required of all seniors majoring in the Division of Horticulture. Designed to correlate the various branches of plant science and horticultural practice.
1 lecture hour, 1 conference period. Credit, 2.
Professor WAUGH.

Landscape Gardening.

Professor WAUGH, Assistant Professor HARRISON, Assistant Professor COMBS.

The instruction in this department is aimed at two objectives: first, the contribution to general education; second, the preparation of men for the professional practice of landscape architecture. The former objective seems important from the fact that landscape gardening offers an excellent opportunity for the practical discussion of the principles underlying all the fine arts. In the professional courses students are prepared, as well as time permits, to begin work in landscape architecture which leads through field experience or post-graduate study to permanent establishment in that profession.

DRAWING.

Required Courses.

25. **I.** FREE-HAND DRAWING. — For sophomores; juniors and seniors may elect. Lettering; free-hand perspective; sketching from type models, leaves, flowers, trees, houses, etc.; laying flat and graded washes in water colors; water-color rendering of leaves, flowers, and trees.
4 2-hour laboratory periods, credit, 4.
Assistant Professor COMBS.

26. **II.** MECHANICAL DRAWING. — For sophomores; juniors and seniors may elect. Inking exercises; geometric problems; isometric projection; intersections; shades and shadows; parallel, angular, and oblique perspective; perspective drawing of buildings. Students should have preparation in plane and solid geometry.
3 2-hour laboratory periods, credit, 3.
Assistant Professor COMBS.

27. **III.** TOPOGRAPHICAL DRAWING. — For sophomores; juniors and seniors may elect. Conventional signs and mapping in ink; conventional coloring and map rendering in water colors.
4 2-hour laboratory periods, credit, 4.
Assistant Professor COMBS.

Prerequisite, Drawing 26.

30. **II.** ELEMENTARY DESIGN. — For sophomore women. Offered for the year 1927–28.
3 2-hour laboratory periods, credit, 3.
Assistant Professor COMBS.

LANDSCAPE GARDENING.

Elective Courses.

50. **I.** MAPPING AND TOPOGRAPHY. — For juniors. Reconnoissance surveys and mapping, with special reference to the methods used in landscape gardening. Must be followed by Course 51.
2 2-hour and 2 3-hour laboratory periods, credit, 5.
Assistant Professor HARRISON.

Prerequisites, Mathematics 26 and 27, Drawing 25, 26, and 27.

51. **II.** ELEMENTS OF LANDSCAPE GARDENING. — For juniors. Detailed study of selected designs of leading landscape gardeners; grade design, road design, etc.
3 3-hour laboratory periods, credit, 4.
Assistant Professor HARRISON.

Prerequisite, Landscape Gardening 50.

52. **III.** GENERAL DESIGN. — For juniors. Field notes; examination of completed works and those under construction; design of architectural details; written reports on individual problems.
2 2-hour and 2 3-hour laboratory periods, credit, 5.
Assistant Professor HARRISON.

Prerequisites, Landscape Gardening 50 and 51, and either plant materials (Horticulture 50 and 51) or advanced mathematics.

75. **I.** THEORY OF LANDSCAPE ART. — For seniors and graduates. The general theory and applications of landscape study, including a brief history of the art. 3 class hours. Credit, 3.
Professor WAUGH.

76. **I.** CIVIC ART. — For seniors. The principles and applications of modern civic art, including city planning, city improvement, village improvement, and rural improvement, with special emphasis upon country planning. Must be followed by Course 77.
3 3-hour laboratory periods, credit, 4.
The DEPARTMENT.

Prerequisite, Landscape Gardening 52.

77. **III.** COUNTRY PLANNING. — For seniors. As stated under Course 76.
3 3-hour laboratory periods, credit, 4.
Professor WAUGH.

Prerequisite, Landscape Gardening 76.

78. **I.** ARCHITECTURE (1928–29). — Alternates with Course 79. For juniors and seniors. The history of architectural development, the different historic types, with special reference to the underlying principles of construction and design and their relations to landscape design. Illustrated lectures, field trips, and study of details including preparation of plates.
3 class hours. Credit, 3.
Assistant Professor HARRISON.

79. **I.** CONSTRUCTION AND MAINTENANCE (1927–28). — Alternates with Course 78. For juniors and seniors. Detailed instruction in methods of construction and planting, in carrying out plans, in organization, reporting, accounting, estimating, etc.; maintenance work in parks and on estates, its organization, management, cost, etc.
3 class hours. Credit, 3.
Assistant Professor HARRISON.

80. **II.** THEORY OF DESIGN. — For seniors. Lectures; exercises in pure design in two and three dimensions; conventional designs; modeling.
3 3-hour laboratory periods, credit, 4.
Professor WAUGH.
Prerequisite, Landscape Gardening 52.

81. **II.** ESTATE DESIGN. — For seniors. Grading and planting plans; garden designs and planting.
3 3-hour laboratory periods, credit, 4.
Assistant Professor HARRISON.

82. **III.** PARK DESIGN. — For seniors.
3 3-hour laboratory periods, credit, 4.
Assistant Professor HARRISON.

Pomology.

Professor SEARS, Professor VAN METER, Assistant Professor DRAIN, Mr. FRENCH, Mr. ROBERTS.

It is the object of the courses in pomology to give the student a thoroughly practical training, so that he may be able to perform or supervise all of the different operations in connection with the growing and marketing of the various fruits. At the same time he is given a thorough grounding in the scientific principles on which the practical work is based, in order that he may better understand the various practices taught.

Elective Courses.

50. **I.** 51. **II.** PRACTICAL POMOLOGY. — For juniors; seniors may elect. A study of the general principles of the growing of fruits, dealing with such questions as selection of site, soils, windbreaks, laying out plantations, choice of nursery stock, pruning, culture of orchards, orchard fertilizers, cropping orchards, etc. Textbooks, lectures, and reference books; field and laboratory exercises.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor SEARS and Mr. ROBERTS.
Prerequisite, Horticulture 27.

52. **III.** SMALL FRUITS. — For juniors; seniors may elect. A study of the growing of small fruits, including raspberries, blackberries, strawberries, currants, blueberries, and grapes, dealing with such questions as propagation, selecting a site for the plantation, soils, fertilizers, pruning, harvesting, marketing, etc.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor SEARS and Mr. ROBERTS.
Prerequisite, Horticulture 27.

54. **II.** Systematic Pomology. — For juniors; seniors may elect. A study of varieties of fruits, including identification, nomenclature, relationships and classification. This course is advised but not required of candidates for the varsity fruit judging team. Lectures, textbooks, laboratory and field exercises.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Assistant Professor Drain.

Prerequisite, Horticulture 27.

75. **I.** Systematic Pomology. — For seniors. A continuation of Course 54, with special reference to nursery variety certification, variety study of pears, grapes, plums, cherries, strawberries, raspberries, blueberries, and blackberries.
1 class hour. 3 2-hour laboratory periods, credit, 4.
Assistant Professor Drain.

Prerequisite, Pomology 54.

76. **II.** Orchard Management. — For seniors. This course will consider the more important problems in connection with the organization and management of a fruit farm. Specialization and diversification, and the place of each of the common fruit crops on the farms of Massachusetts will be studied in relation to the distribution of labor and income. The combination of fruit growing with other lines of farming will be discussed in connection with conditions in this state, and combinations in successful operation will be studied. The course is intended to bring to bear upon the particular problems of the fruit grower principles learned in the previous years in college.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Van Meter.

Prerequisite, Pomology 51.

77. **I.** Commercial Pomology. — For seniors. The picking, handling, storing, and marketing of fruits, including a discussion of storage houses, fruit packages, and methods of grading and packing. Special emphasis is placed upon laboratory and field work, where the student is given actual practice in the picking and packing of most of the principal fruits.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Mr. Roberts.

Prerequisite, Pomology 51.

78. **III.** Spraying. — For seniors. A study of (*a*) spraying materials, their composition, manufacture and preparation for use; the desirable and objectionable qualities of each material; formulas used, cost, tests of purity. (*b*) Spraying machinery, including all the principal types of pumps, nozzles, hose, and vehicles, and their structure and care. (*c*) Orchard methods in the application of the various materials used, with the important considerations for spraying each fruit and for combating each orchard pest. This course is designed especially to familiarize the student with the practical details of actual spraying work in the orchard. Spray materials are prepared, spraying apparatus is examined and tested, old pumps are overhauled and repaired, and the actual spraying is done in the college orchards and small-fruit plantations.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Assistant Professor Drain.

Prerequisite, Pomology 51 or 79.

79. **III.** General Pomology. — For seniors; juniors may elect. Planned to meet the needs of students who cannot devote more than one term to the subject but who want a general knowledge of fruit growing. Consists of lectures and laboratory exercises on such topics as choosing locations, kinds and varieties of fruits to grow, securing and setting the plants, care and cultivation, pruning, spraying, pests, harvesting, and storing.
2 class hours. 1 2-hour laboratory period, credit, 3.
Mr. French.

80. **I.** 81. **II.** 82. **III.** SEMINAR. — For seniors majoring in pomology. Advanced study of problems relating to the business of fruit growing. Each student is assigned a major problem in lines of work in which he is particularly interested. He pursues his studies both by reading and research, and the materials obtained will be worked into theses, which are presented to the seminar for discussion. No lectures are given, but seminar meetings are held for one period each week.
1 class hour. Credit, 1.
The DEPARTMENT.

Vegetable Gardening.

Professor WAUGH, Assistant Professor SNYDER and Mr. STOUT.

The purpose of the courses is to train men (1) for all the commercial branches of vegetable and seed production, and (2) for the professional fields of research, extension work, and teaching.

Elective Courses.

50. **III.** GENERAL VEGETABLE GARDENING. — For juniors; seniors may elect. For those students who desire a general knowledge of agriculture, but do not care to spend the time for extreme specialization. Designed to teach the fundamentals of vegetable growing so they may be applied (1) to the growing of vegetables commercially as a cash crop with other types of agriculture, (2) to the growing of vegetables in the home garden, (3) to agricultural teaching in secondary schools, and (4) to professional agricultural work other than teaching.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Assistant Professor SNYDER.

52. **II.** 53. **III.** PRACTICAL VEGETABLE GARDENING. — For juniors; seniors may elect. A study of the general principles underlying the production of vegetable crops, dealing with such questions as seed and plant growth, plant foods, general cultural factors, control of insects and diseases, marketing and storage. Text and reference books. Laboratory and field exercises. Course 53 may also follow Course 50.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Assistant Professor SNYDER.
Prerequisite, Horticulture 26.

75. **I.** TYPES AND VARIETIES. — For seniors. The systematic study of varieties, including identification, nomenclature, relationships, and classification; exhibiting and judging of vegetables; seed production and variety improvement work.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Assistant Professor SNYDER.
Prerequisite, Vegetable Gardening 52 or 50.

76. **II.** VEGETABLE FORCING. — For seniors. A study of the location and economic stability of the greenhouse industry; physiological factors of plant growth under glass, and the culture and marketing of greenhouse vegetable crops.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Assistant Professor SNYDER.
Prerequisite, Floriculture 53.

77. **III.** COMMERCIAL VEGETABLE PRODUCTION. — For seniors. A study of economic and edaphic conditions relative to the location of the industry in the United States and in Massachusetts; markets and marketing; equipment and various practices of commercial growers. Trips are made through the leading market-gardening sections of New England.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Assistant Professor SNYDER.
Prerequisite, Vegetable Gardening 52 or 50.

DIVISION OF SCIENCE.

Professor GORDON.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

Bacteriology and Physiology.

Professor GAGE, Assistant Professor BRADLEY, Mr. FULLER, Miss GARVEY.

The courses in bacteriology and physiology have been planned to furnish: (1) general training in these subjects for all college students, (2) training for those interested in agriculture, industries, and domestic science, (3) training for prospective students of human or veterinary medicine and public health, (4) training for teachers and laboratory workers in the biological sciences. The courses in bacteriology include introductory and general courses and advanced work, most of which precedes the applied bacteriology of agriculture, the arts, industry, domestic science, and public health. The course in physiology includes considerations of modern ideas on this subject in relation to human welfare.

BACTERIOLOGY.

Required Course.

30. **II.** INTRODUCTORY BACTERIOLOGY. — As stated under Course 50. Required of sophomores majoring in agriculture and rural home life.

2 3-hour laboratory periods, credit, 3.
Professor GAGE and Miss GARVEY.

Elective Courses.

50. **II.** INTRODUCTORY AND GENERAL BACTERIOLOGY. — For juniors; seniors may elect. Designed to make micro-organisms real and significant. An attempt is made to demonstrate their wide distribution and relationship to agriculture, arts, science, industries, and medicine. The course aims to provide an elementary basis for bacteriological study and interpretation and to furnish such material as will be valuable in understanding agricultural, domestic science, and public health problems.

2 3-hour laboratory periods, credit, 3.
Professor GAGE and Miss GARVEY.

51. **III.** DIFFERENTIAL BACTERIOLOGY. — For juniors; seniors may elect. Morphological, cultural, and physiological aspects of micro-organisms are considered. Types of bacteria, their classification and identification, and their functions are studied. This course is fundamental to all advanced and extended microbiological studies.

10 laboratory hours, credit, 5.
Professor GAGE and Miss GARVEY.

Prerequisite, Bacteriology 30 or 50.

60. **I.** PUBLIC HEALTH. — For juniors; seniors may elect. Considers the relation of the human body to its environment in the maintenance of health and the production of disease. This study is based upon human anatomy and physiology. The individual, as a member of society, governed by natural laws, is also of fundamental importance. Animal and human diseases of public health significance are reviewed, their control considered, and their social values discussed. 3 class hours.

Credit, 3.
Professor GAGE.

61. **II.** Public Health. — For juniors; seniors may elect. Public health laws, organization, and the laboratory in relation to public health projects will be discussed. Vital statistics and their significance will be considered.
3 class hours. Credit, 3.
Professor Gage.

Prerequisite, Bacteriology 60.

62. **III.** Public Health. — For juniors; seniors may elect. Sanitation and its relation to agriculture and public health. The microbiological features of air, water, soil, sewage, refuse, and the control of municipal and rural sanitary projects will be considered.
3 class hours. Credit, 3.
Assistant Professor Bradley.

Prerequisite, Bacteriology 61.

75. **I.** Advanced Bacteriology. — For seniors; juniors may elect. This course will include advanced studies in the differentiation of micro-organisms, including serology as applied to classification and diagnosis. This course prepares for the study of more advanced agricultural, domestic science, and public health problems.
10 laboratory hours, credit, 5.
Professors Gage and Bradley.

Prerequisite, Bacteriology 51.

80. **I.** Dairy Bacteriology. — For seniors; juniors may elect. Special emphasis is placed upon milk supplies. The microbial content of milk, its source, its significance, its control; microbial taints and changes in milk; groups or types of organisms found in milk; milk as a carrier of disease-producing organisms; the value of straining, aeration, clarification, centrifugal separation, temperature, pasteurization; the abnormal fermentations of milk; bacteriological milk standards and their interpretation; ripening of milk and cream; the bacterial content of butter; a survey of the microbiology of cheeses; a study of special dairy products, such as ice cream, condensed milk, artificial milk drinks.
2 3-hour laboratory periods, credit, 3.
Assistant Professor Bradley.

Prerequisite, Bacteriology 51.

81. **II.** Soil Bacteriology. — For seniors; juniors may elect. Such subjects as the number and development of micro-organisms in different soils; the factors which influence their growth; food, reaction, temperature, moisture, and aeration; the changes wrought upon inorganic and organic matter in the production of soil fertility, ammonification, nitrification, and denitrification; fixation of nitrogen symbiotically and non-symbiotically; methods of soil inoculation receive attention.
2 3-hour laboratory periods, credit, 3.
Assistant Professor Bradley.

Prerequisite, Bacteriology 51.

82. **III.** Food Bacteriology. — For seniors; juniors may elect. A study of the principles of food preservation and food conservation by means of drying, canning, refrigerating, and addition of chemicals. Food fermentations, as illustrated by bread, pickles, sauerkraut, ensilage, vinegar, wine, etc., are examined. Decomposition of foods, as may be seen in meat, oysters, fish, milk, etc., as well as diseased and poisonous foods, receive consideration. Contamination of food supplies by means of water, sewage, handling, exposure, diseased persons, etc., is of especial significance and is demonstrated by laboratory exercises. Laboratory inspection of foods is now a subject of great import and is given attention.
2 3-hour laboratory periods, credit, 3.
Assistant Professor Bradley.

Prerequisite, Bacteriology 51.

PHYSIOLOGY.

33. **I.** GENERAL PHYSIOLOGY. — Required of sophomores majoring in rural home life; sophomores, juniors, and seniors may elect. The object of this course shall be to adapt the elements of physiology to the modern viewpoint. The relationship and influence of experimental biology, physical chemistry, and biochemistry upon physiology will be considered. The course is planned as an introductory course for those who wish to study physiology in its essentials but lack extensive preparation. Applications and demonstrations will be made of the practical side of nutrition, exercise, mental work, fatigue, and respiration as they relate to conservation of human and animal life.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor GAGE and Miss GARVEY.

34. **II.** GENERAL PHYSIOLOGY. — For sophomores; juniors and seniors may elect. Physiology of nutrition with special reference to intermediate and basal metabolism. Introductory work on nerves and nerve action, and a more detailed consideration of internal and external respiration.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor GAGE and Miss GARVEY.
Prerequisite, Physiology 33.

35. **III.** GENERAL PHYSIOLOGY. — For sophomores; juniors and seniors may elect. Physiology of the circulation, absorption, and excretion, with special reference to gross and microscopic anatomy. This course is especially planned for students who expect to major in subjects pertaining to plant and animal life.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor GAGE and Miss GARVEY.
Prerequisite, Physiology 34.

Botany.

Professor OSMUN, Assistant Professor CLARK, Assistant Professor McLAUGHLIN, Assistant Professor TORREY, Assistant Professor DAVIS.

The required courses in botany are planned to present a knowledge of the principles of plant life both for their fundamental importance in agriculture and for their general educational value. Elective courses are of two types: (1) those which have for their chief aim the direct support of technical courses in agriculture and horticulture, and (2) those providing broader, more intensive training in the science. Courses in the second group may lead, when followed by postgraduate study, to specialization in the field. They also furnish excellent training for the specializing in other sciences and in scientific agriculture. In all undergraduate courses the relation of the science of botany to agriculture is emphasized.

Required Courses.

[Courses 3 and 25 constitute a general elementary course in botany, and are required of all students; Course 26 is advised for all who intend to study further in the department.]

3. **III.** INTRODUCTORY BOTANY. — For freshmen. Presents the seed plants as plastic organisms molded by their environment. Also introduces the student to methods of identifying and classifying plants.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Assistant Professors TORREY and CLARK.

25. **II.** INTRODUCTORY BOTANY. — For sophomores. The anatomy and physiology of the seed plants (Phanerogamia).
1 class hour. 2 2-hour laboratory periods, credit, 3.
Assistant Professors TORREY and CLARK.
Prerequisite, Botany 3.

26. **III.** MORPHOLOGY AND TAXONOMY OF THE LOWER PLANTS (CRYPTOGAMIA). — For sophomores. Systematic study of typical forms of bacteria, algæ, fungi, lichens, mosses, ferns.
1 class hour. 3 2-hour laboratory periods, credit, 4.
Professors OSMUN, MCLAUGHLIN and DAVIS.
Prerequisite, Botany 25.

Elective Courses.

50. **I.** 51. **II.** DISEASES OF CROPS. — For juniors; seniors may elect. In order to permit students to specialize on the diseases of crops which are most closely related to their majors or in which they are especially interested, the course is divided for lecture and laboratory work into the following sections: (I) diseases of truck and field crops; (II) diseases of floricultural crops and ornamentals; (III) diseases of fruit crops; (IV) diseases of shade and forest trees; (V) (51 II only) the outstanding diseases of each crop group, for students majoring in entomology. Sections I–IV each consist of one lecture and one two-hour laboratory period per week and may be elected in each term in units of one, two, or three sections. Section V is offered in the second term only, consists of one conference hour and two two-hour laboratory periods per week, and may not be combined with any of sections I–IV.
1, 2, or 3 class hours. 1, 2, or 3 2-hour laboratory periods, credit, 2, 3, 4, or 6.
Assistant Professor MCLAUGHLIN.

52. **I.** 53. **II.** 54. **III.** SYSTEMATIC MYCOLOGY. — For juniors; seniors may elect. Morphology and development of typical species representing the orders and families of fungi; practice in identification, collection, and preservation of fungi; study of systems of classification; collateral reading. A prerequisite of the senior course in plant pathology, but open to all.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Assistant Professor DAVIS.
Prerequisite, Botany 26.

55. **III.** PLANT HISTOLOGY. — For juniors; seniors may elect. Comparative study of the tissues of plants; training in histological methods, including the use of precision microtomes, methods of killing, fixing, sectioning, staining, and mounting; collateral reading and conferences. This course offers valuable training in preparation for further work in botany.
5 2-hour laboratory periods, credit, 5.
Assistant Professors MCLAUGHLIN, TORREY, and DAVIS.
Prerequisite, Botany 3 and 25.

58. **I.** 59. **II.** 60. **III.** SYSTEMATIC BOTANY OF THE HIGHER PLANTS (1928–29). — For juniors and seniors. An intensive study of gymnosperms and angiosperms. Lectures deal with the interrelations of the flowering plants and with their ecology, distribution and economic importance. Laboratory work consists of a critical study of types from the most important natural plant families. Particular emphasis is laid on the flora of Massachusetts. The department herbarium and greenhouses supply material of important tropical forms for study. Alternate with Courses 61, 62, and 63.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor TORREY.

61. **I.** 62. **II.** 63. **III.** THE COMPARATIVE ANATOMY OF GREEN PLANTS (1927–28). — For juniors and seniors. In the lectures an intensive study is directed to the comparative anatomy of green plants from the evolutionary standpoint. Particular emphasis is laid upon the woody forms both living and extinct. Of the latter, the department is fortunate in possessing excellent sets of micropreparations and lantern slides. Alternate with Courses 58, 59, and 60.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor TORREY.

75. I. 76. II. 77. III. Plant Pathology. — For seniors. Comprehensive study of diseases of plants; training in laboratory methods and technique, including culture work and artificial inoculation of hosts; miscellaneous diagnosis; study of literature and representative life histories of pathogens. Prepares for civil service, experiment station and college work.
1 class hour. 4 2-hour laboratory periods, credit, 5.
Professors Osmun and Davis.

Prerequisite, Botany 54.

78. I. Plant Physiology. — For seniors. Study of the factors and conditions of (*a*) plant nutrition, including the taking up of water and mineral substances, the assimilation of carbon and nitrogen, and the release of energy due to the processes of dissimilation; (*b*) plant growth, including the influence of internal and external factors on growth, the development of reproductive and vegetative organs; (*c*) plant movements, including those due to the taking up of water, and those of both motile and fixed forms in response to external stimuli. Weekly conferences are held at which students report on assignments to original sources in the literature.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Assistant Professor Clark.

Prerequisites, Botany 26; Chemistry 51.

79. II. 80. III. Plant Physiology. — For seniors. As stated under Course 78.
2 class hours. 1 or 3 2-hour laboratory periods, credit, 3 or 5.
Assistant Professor Clark.
Prerequisite, Botany 78 for the 5-credit course; Botany 25 for the 3-credit course.

General and Agricultural Chemistry.

Professor Lindsey, Professor Chamberlain, Professor Peters, Assistant Professor Serex, Dr. Hinegardner.

In teaching the courses in chemistry, emphasis is laid on both their educational and their vocational value. The courses in the freshman year deal with fundamental principles and give the student such an understanding of the subject as will enable him to apply it in farm practice. The more advanced courses, including quantitative analysis, organic, physiological, and physical chemistry, are for those who intend to become teachers and workers in the allied sciences, or who desire to follow agricultural chemistry as a vocation. Those completing the undergraduate courses are fitted for positions in the agricultural industries — fertilizer, feed, and insecticide manufacture — as well as in other lines of industry, and in the State experiment stations, in commercial laboratories, and in high school teaching. Postgraduate students are prepared for positions as teachers in colleges, and for more advanced positions in industry and in the experiment stations.

Required Courses.

1. I. 2. II. General Chemistry. — For freshmen who do not present chemistry for entrance and who begin the subject in college. It presents an introduction to the fundamental chemical laws, together with a study of the typical acid- and base-forming elements and their compounds. The second term contains some of the material given in Courses 4 and 5.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Dr. Hinegardner.

4. I. Advanced General Chemistry. — For freshmen who present chemistry for entrance. A review of general chemistry centered, for the most part, about the laboratory work, which takes the synthetic form. Substances of agri-

cultural importance are prepared in quantity and studied in detail by the student. These include ammonium sulfate, superphosphate, muriate and sulfate of potash, arsenate of lead, Paris green, Bordeaux mixture, lime-sulfur, and emulsions. Textbooks, Holmes' *General Chemistry,* and Peters' *The Preparation of Substances Important in Agriculture.*

2 class hours. 2 2-hour laboratory periods, credit, 4.
Professor Peters.

Prerequisite, Entrance Chemistry.

5. **II.** Inorganic Agricultural Chemistry. — A continuation of Course 4, for freshmen who present chemistry for entrance. A study of the chemical composition, properties, and reactions of soils, fertilizers, fungicides, and insecticides. The laboratory work is divided into three parts: (*a*) qualitative examination of soil, plant ash, and superphosphate; (*b*) approximate quantitative determination of moisture, ash, carbonic acid, phosphoric acid, potash, nitrogen, etc., in farm crops, soils, and fertilizers; (*c*) special work on retention of salts by soil, leaching of lime from the soil by carbonated water, etc.

2 class hours. 2 2-hour laboratory periods, credit, 4.
Assistant Professor Serex.

Prerequisite, Chemistry 4.

25. **II.** Qualitative Analysis. — *Basic.* — For sophomores. The systematic analysis of metallic salts, presented from the ionic viewpoint. A close study of the tests used in the separation and identification of the metals, and the application of these tests to unknown mixtures. Text, Medicus' *Qualitative Analysis,* with Stieglitz's *Qualitative Analysis* and Gooch and Browning's *Qualitative Analysis* for reference. This course should be taken by all intending to follow chemistry as a vocation.

2 class hours. 2 2-hour laboratory periods, credit, 4.
Assistant Professor Serex.

Prerequisite, Chemistry 2 or 5.

26. **III.** Qualitative Analysis. — *Acidic.* — For sophomores. A continuation of Course 25.

1 class hour. 2 2-hour laboratory periods, credit, 3.
Assistant Professor Serex.

30. **II.** Organic Agricultural Chemistry. — For sophomores; juniors and seniors may elect. Embraces the study of the most important groups of organic compounds of plants and animals, the composition of plants, the chemistry of plant growth, plants as food and as industrial material, the composition of animals, the chemistry of digestion, also the study of some of the products related to plants and animals, such as milk, butter, cheese, sugar, and alcohol. The treatment of the subject is general, avoiding (so far as possible) complicated chemical facts and relationships, and endeavoring simply to make the student acquainted with the general chemistry of plants and animals and agricultural processes and products. Textbook: Chamberlain's *Organic Agricultural Chemistry.*

3 class hours. 2 2-hour laboratory periods, credit, 5.
Professor Chamberlain.

Elective Courses.

51. **I.** 52. **II.** 53. **III.** Organic Chemistry. — For juniors; seniors may elect. A systematic study, both from texts and in the laboratory, of the more important compounds in the entire field of organic chemistry. Especial attention is given to those compounds which are found in agricultural products or are manufactured from them. These include alcohols, acids, esters, fats, carbohydrates, and proteins. In the third term compounds in the benzene series are considered. The work forms a foundation for courses in physiological chemistry and agricul-

tural analysis, and is especially planned for those majoring in chemistry or the other sciences. Textbook, Chamberlain's *Organic Chemistry.*

3 class hours. 2 3-hour laboratory periods, credit, 6.

Professor CHAMBERLAIN.

Prerequisite, Chemistry 2 or 5. Chemistry 26 is prerequisite for those majoring in chemistry.

61. **I.** QUANTITATIVE ANALYSIS. — For juniors; seniors may elect. The course includes the gravimetric determination of chlorides, sulfates, iron; the volumetric analysis of acids and bases; and the dichromate method for iron. Text, Smith's *Quantitative Chemical Analysis.*

1 class hour. 2 4-hour laboratory periods, credit, 5.

Professor PETERS.

Prerequisite, Chemistry 25. Chemistry 26 is prerequisite for those majoring in chemistry.

62. **II.** For juniors; seniors may elect. A continuation of Course 61. A study of potassium permanganate as a volumetric reagent; limestone is analyzed; phosphorus is determined in soil; and the perchlorate method for potash is carried out. Analytical problems are a part of the work.

2 class hours. 2 4-hour laboratory periods, credit, 6.

Professor PETERS.

63. **III.** For juniors; seniors may elect. A continuation of Course 62. A study of the oxidation reactions of iodin and the precipitating reactions of thiocyanate; the analysis of Paris green and lead arsenate. The work closes with water analysis. By means of assigned readings students are shown the importance of library work. *Methods of the American Public Health Association* is used as a supplementary text.

1 class hour. 2 4-hour laboratory periods, credit, 5.

Professor PETERS.

75. **I.** PHYSICAL CHEMISTRY. — For seniors. A study of the fundamental theories and laws of physical chemistry, together with laboratory work which includes the important methods of physicochemical measurements.

3 class hours. 6 laboratory hours, credit, 6.

Assistant Professor SEREX.

Prerequisite, Chemistry 61.

80. **I.** PHYSIOLOGICAL CHEMISTRY. — For seniors. Supplementary to Courses 51, 52, and 53. To those who expect to take up scientific work in microbiology, botany, agronomy, animal husbandry, etc., and who have had Courses 51, 52, and 53, it gives acquaintance with the chemistry of the physiological processes in plants and animals, by means of which some of the important organic compounds studied in Courses 51, 52, and 53 are built up in the living organism or are used as food by it. In the lectures, the study of food and nutrition as related to both human and domestic animals is the principal subject. In the laboratory, experimental studies are made of the animal body and of the processes and products of digestion, secretion, and excretion.

3 class hours. 2 2-hour laboratory periods, credit, 5.

Dr. HINEGARDNER.

81. **II.** FOOD ANALYSIS. — For seniors. Primarily the analytical study of milk and butter. May also include the analysis of other food stuffs for nutritive value or for impurities.

1 class hour. 2 4-hour laboratory periods, credit, 5.

Dr. HINEGARDNER.

Prerequisite, Chemistry 61.

86. **II.** Review of General Chemistry. — For seniors. Primarily for students majoring in chemistry; others may elect by permission of the instructor. A knowledge of physical chemistry is desirable. The review of general chemistry is largely theoretical, using as text Alexander Smith's *Introduction to Inorganic Chemistry*, or Mellor's *Modern Inorganic Chemistry*. Some subjects may be enlarged by special lectures, such as atomic structure, Werner's co-ordination theory, crystal structure as shown by X-rays.

3 class hours. Credit, 3.

Professor Peters.

87. **III.** History of Chemistry. — For seniors. An historical and biographical study of chemistry and chemists. The aim of the course is: (1) to give the student a comprehensive view of the science as a whole, through a study of the development of new ideas and the establishment of new theories and laws; and (2) to arouse an enthusiastic interest in the subject and an appreciation of the true spirit of scientific research, through a sympathetic presentation of the work and lives of the great chemists who have been the creators of the chemistry of to-day. The course will consist of lectures, supplemented by systematic correlated reading, and the preparation of reports or essays.

3 class hours. Credit, 3.

Professor Chamberlain.

90. **II.** 91. **III.** Special Work in Chemical Problems. — For seniors. An assignment is made to each student and he is expected to learn how research is done. The problem may be in analytical, general, agricultural, or industrial chemistry, and is to be continued for two terms.

1 class hour. 8 laboratory hours, credit, 5.

Professor Peters.

92. **II.** 93. **III.** Special Work in Organic Chemistry. — For seniors. In this course, as in Courses 90 to 97, the student may give his attention primarily to one line of chemical study for the purpose of becoming acquainted with methods of research. To those whose tastes and interests are in connection with the organic problems of agricultural chemistry, many subjects of study present themselves, among which may be mentioned: proteins, carbohydrates, fats; organic nitrogenous compounds in fertilizers and soils and their relation to plants; the commercial production of alcohol from agricultural products; dyes, synthetic medicines, perfumes, etc.

1 class hour. 8 laboratory hours, credit, 5.

Professor Chamberlain.

Prerequisites, Chemistry 51, 52, 53, and 80.

94. **II.** 95. **III.** Special Work in Physical Chemistry. — For seniors. The field of agricultural chemistry offers many problems that have been attacked through the methods of physical chemistry; such, for example, are the hydrolysis of salts and of minerals and the absorption of salts and fertilizers by soils. This course is designed to familiarize the student with the literature on a special topic, and to give an insight into the methods of research. Each student selects one line of work and follows it through the course, repeating some of the original work. Students interested in colloid chemistry may make a brief study of fundamentals during the first term of this course, with the ultimate object of selecting a problem along this line for the second term.

1 class hour. 8 laboratory hours, credit, 5.

Assistant Professor Serex.

Prerequisite, Chemistry 75.

96. **II.** 97. **III.** Special Work in Physiological and Food Chemistry. — For seniors. An opportunity for those so interested to pursue the study of some physiological or food problem. This course is intended to familiarize the

student with the nature of research under the careful supervision of the instructor. The problems of physiological chemistry are of a varied and interesting character.
1 class hour. 8 laboratory hours, credit, 5.
Dr. Hinegardner.

Prerequisite, Chemistry 80.

Entomology.

Professor Fernald, Professor Crampton, Assistant Professor Alexander, Mr. Farrar, Mr. Salman.

Courses in entomology are for two purposes: (1) The introductory courses aim to give the students a general knowledge of insects, particularly in their relations to man, his crops, his domestic animals, and his health. (2) Later courses are intended to train students desiring to specialize in entomology to become United States, State, or experiment station entomologists, teachers, foresters, tree wardens, entomologists connected with insecticide-manufacturing companies, consulting entomologists, or to occupy other positions where an expert knowledge of insects is called for.

26. **I.** General and Economic Entomology. — Required of sophomores in the Divisions of Horticulture and Science; sophomores, juniors, and seniors may elect. For students who desire some knowledge of insects, but who cannot give more than one term to the subject; also an introduction to the later courses for those who intend to follow entomology further. Touches briefly upon the structure of insects so far as this is needed for such a course; deals with metamorphosis and classification to the larger groups, and discusses the most important methods and materials used for control. The greater part of the time is devoted to special study of the most important insect pests, particularly of New England, showing their modes of life, the injuries they cause, and the best methods of control. In this way the most serious pests of fruit trees, ornamental trees and shrubs, market-garden and green-house crops, field crops, animals, and man are treated.
4 class hours. Credit, 4.
Professor Fernald.

28. **III.** General and Economic Entomology. — For sophomores; juniors and seniors may elect. Three class-room exercises to about May 1; thereafter three field exercises per week. In the field the work of insects found will be studied and a collection of insects made. Methods of collecting, preparing, and mounting insects for collections will be taught. In the class room until about May 1, studies preparatory to the field work will be given. Class limited to 30 members.
3 class hours to about May 1; thereafter, 3 2-hour laboratory periods, credit, 3.
The Department.

Prerequisite, Entomology 26.

50. **I.** 51. **II.** Pests of Special Crops. — For juniors and seniors not majoring in entomology. The work may be begun in either the fall or the winter term, and may be continued through the winter term by students beginning in the fall. The laboratory work is largely individual in these courses. Students majoring in subjects other than entomology, who desire a more complete knowledge of the insects connected with their own major lines of work, can obtain it through these courses. A student majoring in pomology, for example, will devote his time in this course to a careful study of the insects injuring the fruit trees in which he is interested, learning how to recognize their different stages, their work, and the best methods for their control. Work of this kind is available on the insects attacking field crops, market-garden crops, tree fruits, small fruits, shade trees and shrubs, forest trees, flowers, the domestic animals, household articles, and man.

3 2-hour laboratory periods, credit, 3.
Professor Fernald and Mr. Salman.

52. **I.** CLASSIFICATION OF INSECTS. — For juniors specializing in entomology. Laboratory work on the identification and classification of insects of various groups.

2 2-hour laboratory periods, credit, 2.
Assistant Professor ALEXANDER.

Accompanying Entomology 53.

53. **I.** INSECT MORPHOLOGY. — For juniors specializing in entomology and for other juniors or seniors having the prerequisite. The lectures treat of the external and internal anatomy of insects, particularly those parts used in identification, a knowledge of which is needed, in the accompanying Course 52. In the laboratory the external anatomy of the most important groups is studied, with emphasis on the characters used in learning the names of insects, and on the methods of using analytical keys.

2 class hours. 3 2-hour laboratory periods, credit, 5.
Professor CRAMPTON.

Prerequisite, Entomology 26.

55. **II.** Continuation of Course 52. A part of the time is devoted to a study of insects concerned in conveying diseases of man and other animals.

4 2-hour laboratory periods, credit, 4.
Professors CRAMPTON and ALEXANDER.

56. **II.** PESTS OF SPECIAL CROPS. — For juniors majoring in entomology. Individual laboratory work on the most important insect pests of this country, and the preparation and presentation of bulletin material on them.

3 2-hour laboratory periods, credit, 3.
The DEPARTMENT.

57. **III.** CLASSIFICATION OF INSECTS. — Continuation of Course 55.

2 2-hour laboratory periods, credit, 2.
Assistant Professor ALEXANDER.

75. **III.** FOREST AND SHADE-TREE INSECTS. — For juniors; seniors may elect. The lecture work deals with the principles and methods of controlling insects which attack forests and forest products, shade trees, etc. The laboratory periods are devoted to a study of the more important species, their identification, biology, and specific control measures. Field work supplements laboratory study if time permits. One entire Saturday for field excursion also required.

1 class hour. 3 2-hour laboratory or field periods, credit, 4.
Assistant Professor ALEXANDER.

Prerequisites, Entomology 26; 52 and 53 desirable.

76. **I.** ADVANCED ENTOMOLOGY. — For seniors. Studies on insect bionomics; scale insects, their structure, habits, methods of mounting, identification, etc.; internal anatomy and organology.

2 class hours. 3 2-hour laboratory periods, credit, 5.
Professors CRAMPTON and ALEXANDER.

Prerequisite, Entomology 55.

77. **II.** ADVANCED ENTOMOLOGY. — For seniors. Studies of the life history, habits, and methods of control of the important insect pests of the United States; recognition tests of these pests and an examination of the literature on them; methods of bulletin preparation.

3 2-hour laboratory periods, credit, 3.
Assistant Professor ALEXANDER.

Prerequisite, Entomology 76.

78. **III.** ADVANCED ENTOMOLOGY. — For seniors. Classification of insects and of their early stages; principles of classification, the use of literature on entomology, and the preparation of bibliographies and indices; the enemies of insects.
1 class hour. 3 2-hour laboratory or field periods, credit, 4.
Professors FERNALD, CRAMPTON, and ALEXANDER.

Prerequisite, Entomology 77.

79. **I.** INSECTICIDES AND THEIR APPLICATION. — For seniors; juniors may elect. Lectures on the composition, preparation, and methods of application of insecticides; other control measures.
3 class hours. Credit, 3.
Professor FERNALD.

Prerequisite, Entomology 26.

90. **II.** EVOLUTION. — For seniors; juniors may elect. In order to demonstrate the universal scope and operation of the laws of evolution, the course includes a brief sketch of the probable origin and evolution of matter as viewed in the light of modern physical and chemical research; the evolution of the solar system, leading to the formation of the earth; the changes in the earth, preparatory to the production of life; the physical and chemical basis of life; the probable steps in the formation of living matter, and the theories concerning it; the evolution of living things; the developmental history of man, and of the races of mankind; the evolution of human intelligence, languages, culture, institutions, etc., and man's probable future in the light of his past development. Especial consideration is given to the factors of evolution, the basic principles of heredity, variation, and similar topics, with particular reference to their application to human welfare; and the recent contributions in the field of entomology to the advancement of our knowledge of these fundamental principles are briefly reviewed.
3 class hours. Credit, 3.
Professor CRAMPTON.

COURSES IN BEEKEEPING.

The beekeeping courses are offered with the following aims: (1) To meet the increase in vocational opportunities for the production of bees or honey as a business. (2) To study the beekeeping needs of fruit and truck-crop industries and the part that bees play in pollinating flowers. (3) To acquaint the student with a recreational field of many phases, which can be made profitable.

65. **III.** INTRODUCTORY BEEKEEPING. — For juniors; seniors may elect. A detailed study is made of the bee colony, including its organization, the life of its individuals in relation to the colony, and the cycle of the year. Attention is given to practical methods of managing colonies during the spring and early summer. Spring pollen, nectar flora, and the use and needs of bees for horticulturists are other phases of the work covered. The laboratory work provides a study of beekeeping equipment; individual manipulation and an understanding of colony development is afforded. To be complete, this course should be followed by Course 85.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Mr. FARRAR.

85. **I.** INTRODUCTORY BEEKEEPING. — For seniors. The work begun in Course 65 is continued for the completion of the beekeeping year, including late summer and fall management, wintering, and care and marketing of the crop. A more detailed study is made of regional differences, methods, and requirements for different types of honey production.
2 class hours. 1 2-hour laboratory period, credit, 3.
Mr. FARRAR.

86. **II.** ADVANCED BEEKEEPING. — For seniors. Advanced studies are made of important beekeeping problems, including anatomy and physiology; senses

and bee behavior; soil and climatic factors influencing nectar secretion; kinds, importance, and distribution of pollen and nectar sources; bee disease control; marketing problems; queen rearing and commercial bee production. Parts of this work are made individual, depending on the needs of the student.
2 class hours. 1 2-hour laboratory period, credit, 3.
Mr. Farrar.

Mathematics and Civil Engineering.

Professor Ostrander, Professor Machmer, Assistant Professor Moore, Mr. Boutelle.

The work of the freshman year is required. It is intended to furnish the necessary drill and groundwork needed for many of the scientific and practical courses of other departments. Thoroughness and accuracy are insisted upon. The advanced work in mathematics is taught from a practical standpoint, and many of its applications to other subjects are given. The courses in surveying and civil engineering are given to furnish the groundwork for a professional career. Special emphasis is given to the subjects bearing on highway construction and maintenance.

Required Courses.

1. **I.** Higher Algebra. — For freshmen. A brief review of radicals, quadratic equations, ratio and proportion, and progressions; graphs, binomial theorem, summation of series, variation, determinants, permutations and combinations, logarithms, and theory of equations. Reitz and Crathorne's *College Algebra.*
3 class hours. Credit, 3.
Professors Machmer, Moore, and Mr. Boutelle.

2. **II.** Mathematical Analysis. — For freshmen. A review of methods of computation, with special emphasis on short processes and the making of close approximations. A study of some of the different modes of variation; finding the exact or approximate relations (equations) between the varying quantities, particularly as illustrated by the use of the graph. Also a study of the properties of closed figures, such as polyhedra, cylinders, cones, and the sphere, and calculations of their surfaces and volumes. An effort is made to apply mathematical processes directly to the work given in the various technical departments of the college.
3 class hours. Credit, 3.
Professors Machmer, Moore, and Mr. Boutelle.

3. **III.** Plane Trigonometry. — For freshmen. The trigonometric functions as lines and ratios; proofs of the principal formulas, transformations; inverse functions, use of logarithms; the applications to the solution of right and oblique triangles; practical applications; trigonometric equations.
3 class hours. Credit, 3.
Professors Machmer, Moore, and Mr. Boutelle.

Elective Courses.

26. **II.** Plane Surveying. — For sophomores; juniors and seniors may elect. The elements of the subject, including the adjustment and use of the usual instruments. Textbook and lectures.
3 class hours. Credit, 3.
Professors Ostrander and Moore.

27. **III.** Plane Surveying. — For sophomores; juniors and seniors may elect. As stated under Course 26. Includes field work.
3 2-hour laboratory periods, credit, 3.
Professors Ostrander and Moore.
Prerequisite, Mathematics 26.

50. **I.** ANALYTIC GEOMETRY. — For juniors; seniors may elect. A discussion of the geometry of the line, the circle, conic sections, and the higher plane curves. Ford's *Analytic Geometry*.
3 class hours. Credit, 3.
Professor MACHMER.

Prerequisites, Mathematics 1, 2, and 3.

51. **II.** 52. **III.** DIFFERENTIAL AND INTEGRAL CALCULUS. — For juniors; seniors may elect. A first course in the subject, with some of the more important applications to applied sciences.
5 class hours. Credit, 5.
Assistant Professor MOORE.

Prerequisites, Mathematics 1, 2, and 3.

53. **II.** ELEMENTARY STRUCTURES. — For juniors; seniors may elect. An elementary course in roofs and bridges. Textbook and lectures.
3 class hours. 1 2-hour laboratory period, credit, 4.
Professor OSTRANDER.

75. **I.** HYDRAULICS AND SANITARY ENGINEERING. — For seniors; juniors may elect. Hydrostatics, theoretical hydraulics, orifices, weirs, pipes, conduits, water supply, hydraulic motors, sewers and sewage treatment. Textbook and lectures.
5 class hours. Credit, 5.
Professor OSTRANDER.

76. **I.** MATERIALS OF CONSTRUCTION. FOUNDATIONS AND MASONRY CONSTRUCTION. — For seniors; juniors may elect. Textbook and lectures.
5 class hours. Credit, 5.
Professor OSTRANDER.

77. **II.** ROADS AND RAILROADS. — For seniors; juniors may elect. Topographic and higher surveying, highway construction, earthwork, pavements, and railroad construction. Textbook and lectures.
3 class hours. Credit, 3.
Professor OSTRANDER.

78. **III.** ROADS AND RAILROADS. — For seniors; juniors may elect. As stated under Course 77.
3 2-hour laboratory periods, credit, 3.
Professor OSTRANDER.

Prerequisite, Mathematics 77.

Physics.

Professor POWERS, Assistant Professor ALDERMAN.

The courses in this department present a basic study of the physical laws and phenomena of nature with special emphasis on the application of the principles studied to the sciences of agriculture, botany, chemistry, and zoölogy. In addition, the courses furnish satisfactory training for pre-medical students and for prospective teachers in secondary schools. Courses 25, 26, and 27 constitute a study in general physics. The other courses afford opportunity for more advanced and individual work.

Required Courses.

25. **I.** MECHANICS. — For sophomores. This course is a study of the equilibrium of rigid bodies; energy, work, friction; rectilinear, curvilinear, and harmonic motions; rotation; fluids at rest and in motion; elasticity, surface tension, and wave motion.
3 class hours. 1 2-hour laboratory period, credit, 4.
Professors POWERS and ALDERMAN.

26. **II.** MAGNETISM AND ELECTRICITY. — For sophomores; juniors and seniors may elect. Includes magnetism, electrostatics, production and properties of electric currents, electrical appliances and machines, oscillatory circuits and vacuum-tubes.
3 class hours. 1 2-hour laboratory period, credit, 4.
Professors POWERS and ALDERMAN.

27. **III.** HEAT AND LIGHT. — For sophomores; juniors and seniors may elect. Thermometry, expansion, calorimetry, hygrometry, transmission of heat, changes of state, radiation; wave theory of light, optical instruments, analysis of light, interference, polarization.
3 class hours. 1 2-hour laboratory period, credit, 4.
Professors POWERS and ALDERMAN.

Elective Courses.

50. **I.** 51. **II.** 52. **III.** EXPERIMENTAL PHYSICS. HEAT, LIGHT, MAGNETISM, ELECTRICITY, PHOTO-ELECTRICITY, THERMIONICS. — For juniors and seniors. This course is planned to give the student a good grounding in methods of measurement in the subjects indicated, which will be useful in many fields of investigation. Independent work being emphasized, it is possible to meet the needs of individual students. Modern methods are stressed and instruments of precision are used.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professors POWERS and ALDERMAN.
Prerequisites, Physics 26 and 27.

55. **III.** ANALYTICAL MECHANICS. — For juniors; seniors may elect. An introduction to the application of the calculus to the mechanics of solids; statics and kinetics of rigid bodies; elasticity; vector analysis. For students who have taken or are taking Mathematics 52. Not given 1927–28.
3 class hours. Credit, 3.
Assistant Professor ALDERMAN.

75. **I.** 76. **II.** 77. **III.** THEORY OF LIGHT. — For seniors. Propagation of light, formation of optical images, photography, optical instruments, interference, diffraction, spectroscopy, optical phenomena of the atmosphere, polarization and double refraction, magneto-optics, photo-electricity, radiation, electromagnetic waves, X-rays and crystal structure, electron theory, principle of relativity. Not given 1927–28.
3 class hours. Credit, 3.
Professor POWERS.
Prerequisite, Mathematics 51.

Veterinary Science.

Professor LENTZ.

The courses in veterinary science have been arranged to meet the needs (1) of students who propose following practical agriculture; (2) of prospective students of human and veterinary medicine; and (3) of teachers and workers in the biological sciences.

Elective Courses.

50. **II.** VETERINARY HYGIENE. — For juniors; seniors may elect. Acquaints students with the influences which air, water, feed, light, disposal of animal waste material, etc., may have upon the health of animals and upon the health of those who use both animals and animal products.
5 class hours. Credit, 5.
Professor LENTZ.

53. **I.** GROSS VETERINARY ANATOMY. — For juniors; seniors and graduate students may elect. The detailed study of the skeleton is followed by the study of joints and the dissection of the muscular system. Not given 1927–28.
2 3-hour laboratory periods, credit, 3.
The DEPARTMENT.

54. **II.** GROSS VETERINARY ANATOMY. — For juniors; seniors and graduate students may elect. The continuation of Veterinary 53, consisting of dissection and study of the circulatory, digestive, respiratory, genito-urinary, and nervous systems. Not given 1927–28.
2 3-hour laboratory periods, credit, 3.
The DEPARTMENT.

Prerequisite, Veterinary 53.

75. **I.** COMPARATIVE VETERINARY ANATOMY. — For seniors; juniors may elect. The structure of the horse is studied and the structure of the other farm animals compared with it. This is a lecture and demonstrational course — not dissection — and is essential for students who wish to elect Veterinary 77.
5 class hours. Credit, 5.
Professor LENTZ.

76. **II.** GENERAL VETERINARY PATHOLOGY. — For seniors; juniors may elect. A study of fundamental, general pathological conditions: inflammation, fever, hypertrophy, atrophy, etc., a knowledge of which is essential in the prevention, diagnosis, and treatment of disease. Materia medica, therapeutic measures, and poisonous plants are considered briefly.
5 class hours. Credit, 5.
Professor LENTZ.

77. **III.** APPLIED GENERAL VETERINARY PATHOLOGY. — For seniors; juniors may elect. A continuation of Course 76, with specific application of principles to etiology, pathogenesis, and prophylaxis of communicable and non-communicable diseases of domesticated animals.
5 class hours. Credit, 5.
Professor LENTZ.

Prerequisite, Veterinary 75.

78. **I.** ESSENTIALS OF GENERAL PATHOLOGY. — For seniors; juniors may elect. Introduces students to some of the essential anatomical, histological, and general physiological phenomena essential to the understanding of some of the simple general pathological conditions found in domestic animals. Some of the common methods of diagnosis are considered in the laboratory. The various chemical and biological reactions and tests are presented from the standpoint of pure science, showing applications of chemistry and biology. The course serves to educate liberally and to stimulate in the student of agriculture the appreciation of some of the methods used in animal pathology for detecting and controlling some of the more common animal diseases. Lectures, demonstration, and laboratory work. Not given 1927–28.
2 3-hour laboratory periods, credit, 3.
The DEPARTMENT.

79. **II.** 80. **III.** ESSENTIALS OF GENERAL ANIMAL PATHOLOGY. — For seniors; juniors may elect. A continuation of Course 78, devoted to a study of some of the common pathological conditions by means of prepared sections, the aim being to demonstrate to the student abnormal animal histological structures commonly observed when material from various cases of animal diseases is prepared for microscopical study. Some of the biological products used in protecting animals against disease are considered. Not given 1927–28.
2 3-hour laboratory periods, credit, 3.
The DEPARTMENT.

Prerequisite, Veterinary 78.

85. **I.** Avian Pathology. — For seniors; juniors may elect. A course in poultry diseases. The object is to present information concerning the common diseases of poultry, their etiology, diagnosis and prevention. Consists of a systematic study of the diseases of the alimentary tract, liver, and abdominal region, followed by a study of the diseases of the respiratory system, circulation, and kidneys. The important disease-producing external and internal parasites are considered; also diseases of the skin and reproductive organs. Lectures and demonstrations. Not given 1927–28.

2 3-hour laboratory periods, credit, 3.
The Department.

86. **II.** 87. **III.** Avian Pathology. — For seniors; juniors may elect. As stated under Course 85, also devoted to the study of some of the special diseases of poultry. Recent methods used in the control of these diseases are considered and opportunity offered the student for demonstrating various disease processes by means of prepared slides. Lectures, demonstrations, and laboratory work. Not given 1927–28.

2 3-hour laboratory periods, credit, 3.
The Department.

Prerequisite, Veterinary 85.

Zoölogy and Geology.

Professor Gordon. Mr. Gilbert.

The facts and principles of the sciences of zoölogy and geology are taught with emphasis on both their practical and their more general educational values. The elective courses offered under the title of "Special Zoölogy" are designed to serve the student according to his needs. The collections in the zoölogical and geological museums are available for student use.

ZOÖLOGY.

Required Course.

26. **I.** Elements of Zoölogy. — For sophomores. An introductory course offering a brief survey of the general phenomena of animal life. The laboratory studies stress such matters as basic features of structure in animals, correlation of structure and function, adaptation, and kindred problems. The lectures deal with the various principles and doctrines that have grown out of the study of animals.

2 class hours. 2 2-hour laboratory periods, credit, 4.
The Department.

Elective Courses.

53. **I.** Elements of Microscopic Technique. — For juniors; seniors and graduate students may elect. By a series of practical exercises this course reviews the usual methods of preparing material for microscopic examination.

3 2-hour laboratory periods, credit, 3.
The Department.

Prerequisite, Zoölogy 26.

75. **I.** 76. **II.** 77. **III.** Special Zoölogy. — For juniors, seniors, and graduate students. These courses are intended for those who desire special studies in zoölogy to meet some definite need or purpose. Work will be offered in one or more of the following fields: comparative invertebrate zoölogy; comparative vertebrate zoölogy; mammalian anatomy (based on the cat); general embryology; vertebrate embryology (based on the chick and pig); genetics. The work given in any year depends on the demand and other factors; but so

far as practicable, effort is made to accommodate applicants. Students are admitted to these courses only upon consultation with the department.
1 class hour. 2 2-hour laboratory periods, credit, 3.
The DEPARTMENT.

Prerequisite, Zoölogy 26.

79. **III.** ORNITHOLOGY. — For juniors; seniors may elect. The taxonomic characters, relationships, adaptive radiation, migration, distribution, and habits of birds, with practical exercises in the museum and studies of birds in the field.
1 class hour. 2 2-hour laboratory periods, credit, 3.
The DEPARTMENT.

Prerequisite, Zoölogy 26.

GEOLOGY.

Elective Courses.

The courses in geology are open to juniors, seniors and graduate students. Each of the courses named below is distinct, so that a student may elect only one, or any two or all three in any sequence. For those who wish a year's work the desirable sequence is 52. III, 50. I, 51. II. If this sequence is to be followed by undergraduates 52. III must be taken as a junior subject; otherwise the courses may all be taken in either the junior or senior year.

50. **I.** DYNAMIC AND PHYSIOGRAPHIC GEOLOGY. — This course emphasizes geologic processes and especially the work of various agents in shaping the surfaces of the lands.
1 class hour. 2 2-hour laboratory periods, credit 3.
Professor GORDON.

51. **II.** HISTORICAL GEOLOGY. This course gives the more important physical events in the history of North America and a résumé of the plants and animals of the past.
1 class hour. 2 2-hour laboratory periods, credit 3.
Professor GORDON.

52. **III.** ELEMENTS OF PETROLOGY. — This course deals with the composition and properties of the principal rock-forming minerals, and the modes of occurrence and structural features of the various kinds of rocks.
1 class hour. 2 2-hour laboratory periods, credit 3.
Professor GORDON.

DIVISION OF THE HUMANITIES.

Professor MACKIMMIE.

Economics and Sociology.

Professor MACKIMMIE, Assistant Professor CUTLER.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

The courses in economics and sociology are planned with the purpose of giving the student that knowledge and understanding of the important factors and problems in this field of study and life which every active citizen and educated man ought to have.

Required Course.

25. **I.** INTRODUCTION TO ECONOMIC PRINCIPLES AND PROBLEMS. — For sophomores. For description of course see Course 50, **I.**
5 class hours. Credit, 5.
Professor MACKIMMIE.

Elective Courses.

26. **II.** Civilizations, Ancient and Modern. — For sophomores; juniors and seniors may elect. Social history; the evolutionary origin and history of man; characteristics of primitive man, departure from the animal status and beginnings of civilization; origin and development of industries, arts, and sciences; the evolution of languages, warfare, migrations, and social institutions; a study of the powerful natural and human forces that have brought man from the early stages to modern development; characteristic features of the leading civilizations and races of ancient and modern times; beneficial and dangerous factors in American life in view of the history of human civilization.
5 class hours. Credit, 5.
Assistant Professor Cutler.

50. **I.** Introduction to Economic Principles and Problems. — For juniors and seniors. Definitions of economic terms, such as wealth, capital, value, etc.; factors of production, exchange, and consumption; principles of economic production, supply and demand, diminishing returns, division of labor, productive organization, concentration of capital and labor, trust and monopoly problems, public control of production and distribution; principles of exchange, theories of value, money and its problems; international trade, tariff and free trade theories, American merchant marine, reciprocity, and trade treaties; forms of income, wages, interest, rent, profits, and the forces which govern them; principles of spending, economy, luxury, conservation of individual and national resources; principles and agencies for saving, investments, banks, building associations, insurance of all kinds; schemes for social organization; socialism, communism, industrial democracy. Textbook and readings.
5 class hours. Credit, 5.
Professor Mackimmie.

51. **II.** Business and Industry. — For juniors and seniors. The forms, organization, administration, and labor problems of business. Methods of organizing, financing, and administering corporations and partnerships; forms of business administration, wholesaling, jobbing, retailing, advertising, credits and collections; system of industrial remuneration for wage earners, co-operation and preserving industrial peace; problems concerned with protective legislation for workmen and employers, sweated industries, prison labor, child labor, and industrial education.
5 class hours. Credit, 5.
Professor Mackimmie.
Prerequisite, Economics 25 or 50.

52. **III.** Public Finance, Taxation, Money and Banking. — For juniors and seniors. Systems and problems of taxation as they are found in Europe and America; objects for spending public revenue; public debts and methods of organizing them; systems of money and currency problems of America; types, methods, and functions of banks; economic and financial crises and depressions in the United States; modern war finance. Readings and lectures.
5 class hours. Credit, 5.
Professor Mackimmie.
Prerequisite, Economics 25 or 50.

75. **I.** Social Institutions and Social Reforms. — For seniors; juniors by permission. Social institutions, such as the family, the State, property, religions; and such current problems as eugenics, race suicide, divorce, crime and delinquent classes, prison reform, prevention and treatment of dependents and defectives, poverty, its causes and preventions; constructive modern social reform movements for insurance of wage earners, protection of childhood, assurance of safety, health, and play time for all classes. The correctional and charitable institutions of Massachusetts are studied in considerable detail.
5 class hours. Credit, 5.
Assistant Professor Cutler.

History and Government.

Professor MACKIMMIE, Assistant Professor CUTLER.

Required Courses.

25. **II.** AMERICAN GOVERNMENT. — For sophomores. A study of the structure and operation of the machinery of our government; also a study of the history of its development from its inception to the present day.
3 class hours. Credit, 3.
Assistant Professor CUTLER.

27. **III.** CITIZENSHIP. — For sophomores. A course designed to acquaint the student with the most important and immediate problems of government — national, State and local — so that as a citizen he may make an intelligent contribution towards their solution. Lectures and discussions.
2 class hours. Credit, 2.
Assistant Professor CUTLER.

Elective Courses.

50. **I.** GOVERNMENT. — For juniors and seniors. Forms and working methods of the government of Great Britain, Germany, France, Russia, Switzerland, New Zealand, and Canada; historic types and theories of government; forms and methods of Federal, State, and local governments in America; progress and problems of democracy, and new reform movements in organization and administration; new tendencies towards social legislation and extension of governmental control.
3 class hours. Credit, 3.
Professor MACKIMMIE.

51. **II.** MODERN EUROPEAN HISTORY. — For juniors and seniors. The modern history of the principal countries of Europe, especially the great movements and revolutions that developed the nations up to the present generation.
3 class hours. Credit, 3.
Professor MACKIMMIE.

52. **III.** EUROPEAN HISTORY SINCE 1870. — For juniors and seniors. The Franco-Prussian War and the formation of the German Empire, the unification of Italy, the Third French Republic, European expansion in the East, the Russo-Japanese War, and the origin, events, and results of the War of 1914. While a continuation of Course 51, this course will be complete in itself and may be elected by those who have had no history training. Its aim is to provide the basis for an understanding of present-day conditions and for an intelligent participation in world affairs.
3 class hours. Credit, 3.
Professor MACKIMMIE.

Languages and Literature.

Professor PATTERSON, Professor JULIAN, Assistant Professor PRINCE, Assistant Professor RAND, Mr. DURKEE, Mr. DUNBAR, Mr. ANDERSON, Mr. GODING.

ENGLISH.

The courses in English are intended to enable students to express themselves effectively and to appreciate the ideals of English-speaking people throughout their history.

Required Courses.

1. **I.** 2. **II.** 3. **III.** ENGLISH. — For freshmen. Composition. Intended to teach straight thinking, sound structure, clear and correct expression. Lectures, recitations, theme writing, and conferences.
3 class hours. Credit, 3.
Professors PATTERSON, PRINCE, RAND, and Mr. ANDERSON.

25. **I.** 26. **II.** 27. **III.** ENGLISH. — For sophomores. A general reading course in English literature.
2 class hours. Credit, 2.
Professor PATTERSON.

28. **I.** 29. **II.** 30. **III.** ENGLISH. — For sophomores. Public speaking.
1 class hour. Credit, 1.
Professors PATTERSON, PRINCE, RAND, and Mr. ANDERSON.

Elective Courses.

50. **I.** ENGLISH POETRY OF THE ROMANTIC PERIOD (1927–28). — Alternates with Course 53. For juniors; seniors may elect. A course in history, appreciation, and understanding. Some of the writers studied are Gray, Goldsmith, Burns, Scott, Wordsworth, Coleridge, Byron, Keats and Shelley.
3 class hours. Credit, 3.
Professor PATTERSON.

51. **II.** ENGLISH POETRY IN THE NINETEENTH CENTURY (1928–29). — Alternates with Course 54. For juniors; seniors may elect. In general, this course is like Course 50. Tennyson, Browning, Mrs. Browning, Arnold, Clough, the Rossettis, Morris, Swinburne, and others.
3 class hours. Credit, 3.
Professor PATTERSON.

57. **III.** ENGLISH POETRY IN THE NINETEENTH CENTURY (1928–29). — Alternates with Course 58. For juniors; seniors may elect. As stated under Course 51.
3 class hours. Credit, 3.
Professor PATTERSON.

52. **III.** ENGLISH WRITERS FROM MILTON TO POPE. — For juniors; seniors may elect. A survey course that emphasizes the leading writers, literary currents, and the thought of the period. Some of the writers studied are Milton, Dryden, Addison, Swift, and Pope.
3 class hours. Credit, 3.
Professor PATTERSON.

53. **I.** ENGLISH PROSE OF THE ROMANTIC PERIOD (1928–29). — For juniors; seniors may elect. A course in English prose, paralleling Course 50. Some of the writers studied are Goldsmith, Coleridge, Lamb, DeQuincey, and Hazlitt.
3 class hours. Credit, 3.
Professor PATTERSON.

54. **II.** ENGLISH PROSE IN THE NINETEENTH CENTURY (1927–28). — For juniors; seniors may elect. Parallels Course 51. Among the writers considered will be Macaulay, Carlyle, Ruskin, Newman, and Arnold.
3 class hours. Credit, 3.
Professor PATTERSON.

58. **III.** ENGLISH PROSE IN THE NINETEENTH CENTURY (1927–28). — For juniors; seniors may elect. As stated under Course 54. Alternates with Course 57.
3 class hours. Credit, 3.
Professor PATTERSON.

55. **II.** AMERICAN LITERATURE. — For juniors; seniors may elect. A course in the chief American prose writers, among those studied being Franklin, Brockden Brown, Irving, Cooper, Poe, Hawthorne, Emerson, Thoreau, Lowell, Holmes, Parkman.
3 class hours. Credit, 3.
Assistant Professor PRINCE.

56. **III.** AMERICAN LITERATURE. — For juniors; seniors may elect. A course in the chief American poets, among those studied being Freneau, Bryant, Poe, Emerson, Longfellow, Whittier, Holmes, Lowell, Whitman, Lanier.
3 class hours. Credit, 3.
Assistant Professor PRINCE.

60. **I.** 61. **II.** THE LITERATURE OF RURAL LIFE. — For juniors; seniors may elect. A critical and appreciative study of writers, both in prose and poetry, who have interpreted nature from the viewpoint of the lover of country life, who have idealized agriculture, horticulture, and other rural pursuits, and who have upheld as an ideal the development of a rural environment in cities.
3 class hours. Credit, 3.

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65. **I.** ADVANCED COMPOSITION. — For juniors; seniors may elect. Advanced work in expository writing, based upon specimens by contemporary authors and upon the personal experience of the student. Particular attention is given to organization, diction, and style.
3 class hours. Credit, 3.
Assistant Professor RAND.

66. **II.** ADVANCED COMPOSITION. — For juniors; seniors may elect. The preparation of theses and similar manuscripts upon subjects selected by the student. The foundation of this course lies in an orderly accumulation of material followed by an intelligent and readable interpretation of its significance.
3 class hours. Credit, 3.
Assistant Professor RAND.

67. **III.** ADVANCED COMPOSITION. — For juniors; seniors may elect. Work in journalistic and fictional narrative with supplementary reading.
3 class hours. Credit, 3.
Assistant Professor RAND.

75. **III.** PROSE FICTION. — The short story or the novel. For seniors; juniors may elect. Readings, reports, and discussions. Not offered in 1927–28.
3 class hours or library equivalents. Credit, 3.

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79. **II.** SHAKESPEARE. — For seniors; juniors may elect. A cursory survey of the origin and rise of English drama is followed by the reading of about fifteen of Shakespeare's plays, selected to indicate the evolution of the dramatist and to emphasize the various phases of his art. Every attempt is made to deepen the student's appreciation of the personalities to be found in the plays, and of the beauty of the many memorable poetic passages.
3 class hours. Credit, 3.
Assistant Professor RAND.

80. **III.** MODERN DRAMA. — For seniors; juniors may elect. This course traces the development of English drama from the time of the Restoration to the present day. The purpose of the course is to impart an intelligent and sympathetic interest in the theatre of the Twentieth Century.
3 class hours. Credit, 3.
Assistant Professor RAND.

PUBLIC SPEAKING.

Elective Courses.

50. **I.** ARGUMENTATION. — For juniors; seniors may elect. Presents the fundamental principles of argumentation as applied to oral and written discourse, and develops in the student power to handle argument convincingly and persua-

sively. Lectures, discussions of leading questions of the day, practice in brief-drawing and the writing of forensics. The course is recommended for those who desire to enter the intercollegiate debates.
3 class hours. Credit, 3.
Assistant Professor PRINCE.

51. **III.** OCCASIONAL ORATORY. — For juniors; seniors may elect. A study of the principles and the practice of formal oratory; the preparation and delivery of one original oration; prescribed reading in oratory. The course is recommended for those who wish to enter the Flint Contest.
3 class hours. Credit, 3.
Assistant Professor PRINCE.

French, Spanish, and Music.

MR. DUNBAR, MR. GODING.

The aim of the courses in French and Spanish is to give the student a practical knowledge of these languages for the purpose of wider reading and research, to introduce him to some of their treasures in art and science, and through the literature to acquaint him with the people. In the elementary courses as much time as possible is given to oral work, to develop a speaking, as well as a reading, knowledge of the tongue.

FRENCH.

Required Courses.

1. **I.** 2. **II.** 3. **III.** ELEMENTARY FRENCH. — Required of freshmen who do not elect German and who have not presented French for entrance; sophomores, juniors, and seniors may elect. The essentials of grammar are rapidly taught and will be accompanied by as much reading as possible.
3 class hours. Credit, 3.
Mr. DURKEE.

4. **I.** 5. **II.** 6. **III.** INTERMEDIATE FRENCH. — Required of freshmen who present two years of French for entrance and who do not elect German; sophomores, juniors, and seniors may elect. Training for rapid reading. The reading of a number of short stories, novels, and plays; composition; reports on collateral reading from periodicals and scientific texts in the library.
3 class hours. Credit, 3.
Mr. DUNBAR and Mr. GODING.
Prerequisites, French 1, 2, and 3, or Entrance French.

Elective Courses.

25. **I.** 26. **II.** 27. **III.** INTERMEDIATE FRENCH. — For sophomores; juniors and seniors may elect. Training for rapid reading. The reading of a number of short stories, novels, and plays; readings from periodicals and scientific texts in the library.
3 class hours. Credit, 3.
Mr. DUNBAR.
Prerequisites, French 1, 2, and 3.

28. **I.** 29. **II.** 30. **III.** ADVANCED FRENCH. — For sophomores; juniors and seniors may elect. A reading course. Selections from nineteenth-century masterpieces; general view of the history of French literature and the development of French culture, with representative works of the important periods.
3 class hours. Credit, 3.
Mr. GODING.
Prerequisites, French 4, 5, and 6, or 25, 26, and 27.

50. **I.** 51. **II.** 52. **III.** SCIENTIFIC FRENCH. — For juniors; seniors may elect. Meets the requirements of individual students and equips them with exact English equivalents for the French scientific terms in their particular science. Word lists of scientific terms are required, and also weekly readings and reports from scientific works in the subject in which they are majoring. Several scientific works are read.
3 class hours. Credit, 3.
Mr. GODING.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

75. **I.** 76. **II.** 77. **III.** FRENCH LITERATURE. — For seniors; juniors may elect. Survey of Classical, Romantic, and Modern periods, with readings from representative works of each.
2 class hours. Credit, 2.
Mr. DUNBAR.

Prerequisites, French 4, 5, and 6, or 25, 26, and 27.

SPANISH.

Elective Courses.

50. **I.** 51. **II.** 52. **III.** ELEMENTARY SPANISH. — For juniors; seniors may elect. Open to other students upon arrangement. Grammar, exercises in composition and conversation, reading of selected short stories.
3 class hours. Credit, 3.
Mr. DUNBAR.

75. **I.** 76. **II.** 77. **III.** MODERN SPANISH AUTHORS. — For seniors. Reading from modern Spanish novel and drama; composition; outside reading.
2 class hours. Credit, 2.
Mr. DUNBAR.

Prerequisite, Spanish 52.

MUSIC.

Elective Courses.

50. **I.** HISTORY AND INTERPRETATION OF MUSIC. — For juniors; seniors may elect. History of music among the ancients; medieval and secular music; epoch of vocal counterpoint; development of monophony opera and oratorio; life and works of the greatest representatives of the Classical school — Bach, Händel, Haydn, Gluck, and Mozart.
1 class hour. Credit, 1.
Mr. GODING.

51. **II.** HISTORY AND INTERPRETATION OF MUSIC. — For juniors; seniors may elect. A continuation of Course 50. The Romantic school — Beethoven, Schubert, Weber, Mendelssohn, Schumann, Chopin, Berlioz and Liszt; Wagner and the opera.
1 class hour. Credit, 1.
Mr. GODING.

52. **III.** HISTORY AND INTERPRETATION OF MUSIC. — For juniors; seniors may elect. The Modern school and Modern composers.
1 class hour. Credit, 1.
Mr. GODING.

German.

Professor JULIAN, Mr. DURKEE.

The elementary and intermediate courses in German are taught with the purpose of enabling the student to acquire a practical working vocabulary and reading knowledge of the language. The advanced courses either present an introduction to some of the masterpieces of German literature or afford the opportunity for specialized reading in the field of the student's scientific or professional work.

Required Courses.

1. **I.** 2. **II.** 3. **III.** Elementary German. — Required of freshmen who do not elect French and who have not presented German for entrance; sophomores, juniors and seniors may elect. Grammar, reading, and prose composition. Special emphasis is placed on the acquirement of a fundamental stem vocabulary and the ability to understand simple German paragraphs in German.
3 class hours. Credit, 3.
Professor Julian and Mr. Durkee.

4. **I.** 5. **II.** 6. **III.** Intermediate German. — Required of freshmen who present two years of German for entrance and who do not elect French; sophomores, juniors, and seniors may elect. Shorter stories of Baumbach, Gerstäcker, Heyse, Keller, Wildenbruch; selected works of Schiller; grammar review and advanced prose composition.
3 class hours. Credit, 3.
Mr. Durkee.
Prerequisites, German 1, 2, and 3, or Entrance German.

Elective Courses.

25. **I.** 26. **II.** 27. **III.** Intermediate German. — For sophomores; juniors and seniors may elect. Shorter stories of Baumbach and Wildenbruch; abridged novels of Frenssen, Hauff, and Sudermann; grammar review and advanced prose composition.
3 class hours. Credit, 3.
Professor Julian.
Prerequisites, German 1, 2, and 3.

28. **I.** 29. **II.** 30. **III.** Advanced German. — For sophomores; juniors and seniors may elect. Reading and study of the most important literary productions of Goethe, Schiller, and Lessing.
3 class hours. Credit, 3.
Professor Julian.
Prerequisites, German 4, 5, and 6, or 25, 26, and 27.

50. **I.** 51. **II.** 52. **III.** Scientific German. — For juniors and seniors. Intensive and specialized reading of literature in standard German scientific journals and reference books.
3 class hours. Credit, 3.
Professor Julian.
Prerequisites, German 4, 5, and 6, or 25, 26, and 27.

75. **I.** 76. **II.** 77. **III.** German Literature. — For seniors. Advanced language and literary study, conducted entirely in German. Lectures on German literature and history; collateral readings, including masterpieces of different epochs, such as *Niebelungenlied*, Goethe's *Faust*, and a typical modern drama.
3 class hours. Credit, 3.
Professor Julian.
Prerequisites, German 28, 29, and 30.

DIVISION OF RURAL SOCIAL SCIENCE.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

Agricultural Economics.

Professor Cance, Assistant Professor Yount, Miss Foley, Mr. Smart.

Instruction in agricultural economics is designed to show that the agricultural industry justifies its existence chiefly as a supplier of food and raw textile materials for human consumption; that agricultural success is measured by production of values as well as by production of volume of agricultural products; that the goal of the farmer is the largest net profit over a long-time period; that agricultural production includes all processes from purchase of seed and fertilizer and preparation of seedbed until the product reaches the consumer, including collection, transportation, storage, financing, packing, handling, and selling; that a knowledge of the business of agriculture and agricultural commerce is to-day more necessary than a knowledge of agricultural technique. The work of this department is conducted by means of lectures, readings, and research in both library and field.

Required Courses.

26. **II.** Agricultural Industry and Resources. — For sophomores. A descriptive course dealing with agriculture as an industry, and its relation to physiography, movement of population, supply of labor, commercial development, transportation, public authority, and consumers' demand. The principal agricultural resources of the United States are studied with reference to commercial importance, geographical distribution, present condition, and means of increasing the value of the product and cheapening cost of production. Lectures, assigned readings, class topics, and discussions.
4 class hours. 1 2-hour laboratory period, credit, 5.
Miss Foley.

Elective Courses.

50. **I.** Elements of Agricultural Economics. — For juniors; seniors may elect. This course is designed to accompany or follow the course in elements of economics. It deals with the economic principles underlying the welfare and prosperity of the farmer and with those institutions upon which his economic success depends; the economic elements in the production and distribution of agricultural wealth; means of exchange; problems of land tenure and land values; taxation of farm property; and the maintenance of the economic status of the farmer. Lectures, text, readings, topics, and field work.
5 class hours. Credit, 5.
Professor Cance.

51. **III.** The Evolution of Agriculture. — For juniors; seniors may elect. A general survey of the evolution of the agricultural industry. Significant developments are traced and their causes and consequences studied. An attempt is made to give the student a knowledge of the changes which have taken place and which are taking place in the agricultural industry, the conditions which accompany these changes, and to furnish a basis by which the significance and the course of present and future developments in agriculture may be judged. Special emphasis will be placed on the development of agriculture in New England and the United States. Lectures, readings, and library work.
5 class hours. Credit, 5.
The Department.

52. **II.** Co-operation in Agriculture. — For juniors; seniors may elect. The history, principles, and business relations of agricultural co-operation. (1) A survey of the development, methods, and economic results of farmers' organizations and great co-operative movements; (2) the business organization of agriculture abroad, and the present aspects and tendencies in the United States; (3) the principles underlying successful co-operative endeavor among farmers, and practical working plans for co-operative associations, with particular reference to purchase of supplies and the marketing of perishable products. Lectures, text, assigned readings, and practical exercises.
5 class hours. Credit, 5.
Professor Cance.

53. **III.** The Agricultural Market. — For juniors; seniors and graduate students may elect. A study of the forces and conditions which determine the

prices of farm products and the mechanism, methods, and problems concerned with transporting, storing, and distributing them. Supply and demand, course of prices, terminal facilities, the middleman system, speculation in agricultural products, protective legislation, the retail market, and direct sales are taken up. The characteristics and possibilities of the New England market are given special attention. Lectures, readings, assigned studies, and field work.

5 class hours. Credit, 5.

Professor CANCE.

54. **I.** ECONOMICS OF CONSUMPTION. — For juniors and seniors; graduate students may elect. The purpose of this course is a consideration of the importance of consumption in modern industry and commerce; a classification of consumption wants; a survey of the sources of consumption goods, particularly food. This will be followed by a study of standards of living, the laws of consumption, and a discussion on the administration of income. Finally, a short study will be made of the relation of consumption to the problems of population and to the development of the rural people. Lectures, assigned readings, and practical exercises.

3 class hours. Credit, 3.

Miss FOLEY.

75. **II.** RURAL AND BUSINESS LAW. — For seniors; juniors may elect. Land, titles, public roads, rights incident to ownership of live stock, contracts, commercial paper, and distinctions between personal and real property. Text, written exercises, lectures, and class discussions.

5 class hours. Credit, 5.

Mr. SMART.

76. **II.** TRANSPORTATION OF AGRICULTURAL PRODUCTS. — For seniors and graduate students; juniors may elect. The development of highway, waterway, and railway transportation, and its relation to the agricultural and industrial development of the country; the principles governing the operation and control of transportation agencies; present-day problems relating to the shipment of farm products, rates, facilities, and services; methods of reducing wastes in transportation; the economics of the good roads movement and of motor transportation. Lectures, text, and field work.

5 class hours. Credit, 5.

Professor CANCE.

77. **I.** PROBLEMS IN AGRICULTURAL ECONOMICS. — For seniors and graduate students; juniors may elect. An advanced course for those desirous of studying more intensively some of the economic problems affecting the farmer and the production and distribution of the food supply. Current economic questions, agricultural legislation, government aids and subsidies, and causes affecting land valuations are some of the problems discussed. Particular attention will be given to economic problems relating to New England and to agricultural commerce. Students will be encouraged to pursue lines of individual interest.

5 class hours. Credit, 5.

Professor CANCE.

78. **III.** AGRICULTURAL CREDIT AND FINANCE. — For seniors; juniors may elect. Lectures, discussions, and assigned readings. The legitimate use of credit in agriculture and its industry; the production, storage, and marketing of agricultural products; the development, organization, and methods of operation of agricultural credit institutions; the methods by which the individual may increase his credit standing and borrowing power; ways in which the present credit facilities may be increased.

3 class hours. Credit, 3.

Assistant Professor YOUNT.

79. **I.** Agricultural Statistics. — For seniors; juniors and graduate students may elect. The nature and sources of agricultural statistics, the methods of obtaining numerical facts, of analyzing and drawing conclusions from statistical data, and the methods of presenting in a true and forceful manner statistical facts. Opportunity is given in the laboratory for practice in the use of statistical methods and processes, and for experience in dealing with practical statistical problems. The application of statistics and statistical methods in the fields of agricultural economics, extension work, education, journalism, and the business matters connected with the food supply is emphasized.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Assistant Professor Yount.

80. **I.** 81. **II.** 82. **III.** Seminar. — For seniors and graduate students. Research in agricultural economics and history; problems of New England agriculture. Library work and reports. If desirable some other topic may be substituted.
1 or 2 2-hour conference periods, credit, 1 or 2.
The Department.

83. **I.** Salesmanship of Agricultural Products. — For seniors; juniors may elect. The course embraces a study of the principles and practices that are involved in the selling of goods and services. The application of these principles of salesmanship to the disposal of agricultural products is especially emphasized. Types of sales, motives for buying, securing interviews, types of prospects, preparation of sales talks, meeting objections and excuses, and sales demonstrations by students and the instructor are included.
2 class hours. Credit, 2.
Miss Foley.

84. **III.** Advertising Agricultural Products. — For seniors; juniors may elect. A course dealing with the application of the principles of advertising to agricultural products. A study of the nature of advertising, the economics of advertising, the use of media, copy, psychology as applied to advertising, layout, the advertising campaign, advertising agency, etc., is made. The solution of practical problems to emphasize different phases of advertising is required of students.
2 class hours. Credit, 2.
Miss Foley.

85. **II.** 86. **III.** Agricultural Prices. — For seniors and graduate students. A study of the prices of agricultural products and other commodities which are of importance in the agricultural industry. Limited to five students.
2 or 3 2-hour laboratory periods, credit, 2 or 3.
Assistant Professor Yount.

87. **III.** Foreign Trade in Agricultural Products. — For seniors and graduates; juniors may elect. A general course embracing a study of the principles and practices of international trade and the foreign commerce of the United States, particularly with reference to agricultural products. The development and present status of foreign trade in agricultural products, trade relations with foreign nations, the agencies and practices of foreign trade, foreign-trade salesmanship and advertising, the status of New England with reference to foreign trade are some of the topics which will be presented. The work in the course will also include a personal study of special features of foreign trade and of the trade importance of specific subjects. Textbook, class discussions, and class topics.
3 class hours. Credit, 3.
Miss Foley.

88. **III.** Business Accounting. — For seniors; juniors may elect. This course aims to give the student an elementary working knowledge of the principles

underlying the accounting system in the gathering, analysis, and interpretation of accounting data, and of the methods used in accounting and preparing the usual types of business statements. The managerial uses of accounting as a means of business control are the keynote of the course.

1 class hour. 2 2-hour laboratory periods, credit, 3.
Admission by permission of the instructor only.
Assistant Professor YOUNT.

Agricultural Education.

Professor WELLES, Professor GLICK, Mr. HEALD.[1]

The primary aim of the department is to train students for service in some form of educational work. The department seeks to be of the greatest possible service to students who are preparing to teach and whose scholastic standing and general qualifications seem to make them suitable candidates for positions. Students desiring state approval as teachers of agriculture or related subjects should confer with the head of the department as early as possible, to insure a desirable range of preparation, including farm experience, a part of which may be gained after entering college. They should also become acquainted with the State Agent for Agricultural Teacher-Training who approves candidates for positions in special schools and departments of agriculture in high schools. A Teacher-Training certificate will be awarded by the Vocational Educational Division to students who qualify as to farm experience, technical subjects, and educational courses as advised. The department recommends to the State Department of Education such graduates of the college as are entitled to receive the high school teachers' term certificate. Students who major in other departments but expect to teach should consult this department regarding the educational courses best suited to their purposes.

29. **II.** PROBLEMS IN EDUCATION. — For sophomores in the Division of Rural Social Science. The aim of this course is to introduce the student to the field of education through the study of the educational problems in the history of America from the beginning of the Colonial period to the present time. Such an understanding is to be desired in order that the citizens of tomorrow may be able to solve their own educational problems to better advantage.

3 class hours. Credit, 3.
Professor WELLES.

51. **I** and **II.** PRINCIPLES AND METHODS OF TEACHING. — For juniors; seniors may elect. Is intended for students who expect to become teachers. Others must consult the head of the department before registering. The course is based on a good textbook and consists of a study of the general principles of teaching and school management applied to particular "cases" taken from actual experience in public school work. Discussions of the rational solutions of these "cases" tend to fix the ideas in methods. Certain assigned and optional readings, which are both technical and inspirational in character, cover the best that has been printed on the subject of methods of teaching. They are supported by sharp class discussions of the main issues. Observation visits to schools in session are required, with full reports. Exercises in teaching under supervision are also required, with criticism and discussion of methods and results.

5 class hours. Credit, 5.
Professor WELLES.

52. **I.** HISTORY AND PHILOSOPHY OF EDUCATION. — For seniors and graduate students; juniors may elect. A general course in the history of educational theory and practice. Special emphasis is placed upon the philosophical background of education.

5 class hours. Credit, 5.
Professor GLICK.

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[1] State Agent for Agricultural Teacher-Training representing the State Department of Education in the administration of vocational education acts.

55. **I** and **II.** General Psychology. — For juniors; seniors and graduate students may elect. This is an introductory course for those anticipating further study in psychology, as well as a practical and cultural course for those who can take only one course in this field. It deals with the fundamental principles of psychology and their application to the understanding and contro of human thought and action.
5 class hours. Credit, 5.
Professor Glick.

56. **II** and **III.** Educational Psychology. — For juniors; seniors and graduate students may elect. A direct application of psychology to the field of education, and a basic course for both general and specific methods. The course deals with the original nature of the child, the psychology of learning, individual differences, transfer of training, mental tests, etc. Intended primarily for prospective teachers, but open to others who are sufficiently interested.
5 class hours. Credit, 5.
Professor Glick.
Prerequisite, Agricultural Education 55 or consent of the instructor.

75. **II.** Principles of Secondary Education. — For seniors; juniors may elect. This is a study of the American high school. It is designed to acquaint the student with the aims of high school education, the characteristics and tendencies of high school students, the high school curriculum, extra-curricular activities, and the best ideas in regard to the administration of high schools.
3 class hours. Credit, 3.
Professor Welles.

76. **I** and **III.** Special Methods in Teaching Agriculture and Related Science. — For seniors; juniors and others qualified may elect. Owing to the specialized nature of this course, the head of the department must be consulted before registration. The course aims to set out clearly the main details in teaching agriculture and related science from a vocational point of view. The home project is considered the basis. The work covers material and method, laws, policies, state requirements, common practices, teachers' subject and method outlines, project outlines, lesson plans, moot class teaching, observation, references, weekly oral and written reports, etc. The principle of job analysis is employed throughout the course.
5 class hours. Credit, 5.
Professor Welles.

77. **III.** Methods in Extension Teaching. — For seniors; juniors and others qualified may elect. Candidates must consult the head of the department before registering. The course deals with various phases of extension work and the methods by which this work is accomplished. The specific lines are those of the county agent, boys' and girls' club leader, county demonstration agent, and agricultural specialist. The different phases of the work will be discussed by members of the Extension staff who are specialists in their particular lines. The course will be offered jointly by the Extension Service and the Department of Agricultural Education.
3 class hours. Credit, 3.
Professor Welles and Extension Service Staff.

79. **III.** Tests and Measurements. — Limited to fifteen seniors majoring in the department. A study of the development, theory, and construction of the various types of tests and measurements, with special emphasis upon their use in the schools. Practice is given in the administration and scoring of tests. Modern statistical methods are applied to the interpretation of the results.
2 class hours. 1 2-hour conference period, credit, 3.
Professor Glick.

80. **I, II, and III.** Supervised Teaching. — Primarily for seniors; juniors and others qualified may be admitted by arrangement. The course includes (*a*) apprentice, (*b*) practice, and (*c*) observation teaching. Under certain conditions a student may absent himself from college during one term of his junior or senior year for apprentice teaching in agriculture. For detailed information, consult the head of the department. Opportunities for practice teaching in all other lines of work are sought on the campus and in nearby high schools. A limited amount of study of teaching by observation is permissible. Each student is required to pursue a course of professional reading bearing upon the subject he is teaching or observing. The amount of credit depends upon the number, character, and length of teaching or observation exercises and conferences.

Credit, 1 to 5.
The Department.

81. **III.** Seminar in Methods of Teaching. — Open to seniors majoring in agricultural education; graduate students and others by arrangement. This is an opportunity for those definitely intending to teach, to make further studies of methods in special lines other than agriculture, which is provided for in Agricultural Education 76. These include methods in college teaching, special methods in science, etc.

1 2-hour conference period, credit, 2.
Professor Welles.

Prerequisites, Agricultural Education 51 and 56, or equivalents.

83. **III.** Seminar in Applied Psychology. — For seniors and graduate students. Intended for those who desire to study the application of psychology in special fields, such as salesmanship, advertising, medicine, law, public office, extension work, education, business, etc.

1 2-hour conference period, credit, 2.
Professor Glick.

Prerequisites, Agricultural Education 55, and 56 or 85.

85. **I.** Vocational Psychology. — For seniors and graduate students. An application of psychology to the various fields of thought and action other than education.

3 class hours. Credit, 3.
Professor Glick.

Prerequisite, Agricultural Education 55 or consent of the instructor.

95. **II.** Modern Philosophy of Education. — For seniors and graduate students; juniors may elect. A general survey of modern philosophical theories and tendencies with special emphasis upon their influence in determining present educational objectives and procedures. An analysis of the theories underlying various national cultures and ideals, and the significance of education in realizing definite educational objectives.

3 class hours. Credit, 3.
Professor Glick.

Rural Sociology.

Assistant Professor Cutler.

The courses in rural sociology are designed for three purposes: first, to give students an appreciation of the general problems of country life; second, to afford a definite training for students who wish to take up some specific form of social service; and third, to equip students who plan to teach the social sciences in rural high schools. The courses afford the student an opportunity to pursue graduate as well as undergraduate work.

Required Course.

27. **III.** Elements of Rural Sociology. — For sophomores. Social psychology; a broad survey of the field of rural sociology, including such topics as the origin of rural sociology, its methods and problems; relation of sociological to other aspects of agricultural problems; religious, educational, and social ideals of rural people; characteristics and influence of the rural environment; rural institutions — the school, the church, local government — and the effects of modern conditions of life on them; rural organization; problems of progress, an analysis of the needs of rural life in its further development. Lectures, readings, and essays on assigned topics.
3 class hours. Credit, 3.
Assistant Professor Cutler.

Elective Courses.

50. **I.** 51. **II.** 52. **III.** Sociological Laws and their Application. — For juniors; seniors may elect. Village history and evolution; present status and importance of the small town; a general survey of the development of rural government in the United States; relation of the Department of Agriculture, postal system, and the various national commissions and agencies to rural welfare; a study of the organized agencies by which rural communities carry on the various forms of associated life. These courses have special value for New Englanders who wish to understand their semi-urban and town communities. Lectures, readings, field work, discussions, and topical reports. These courses are sequential but may be elected independently.
3 class hours. Credit, 3.
Assistant Professor Cutler.

76. **I.** Field Work in Rural Sociology. — For seniors; juniors may elect. Designed to meet the needs of students who wish to do some constructive work in rural social service while still in college. The work is carried on in co-operation with the various college agencies engaged in rural service. Any project for which credit in this course is to be asked must first have the approval of the head of the department.
2 to 6 laboratory hours, credit, 1 to 3.
Assistant Professor Cutler.
Prerequisites, Rural Sociology 27, or 50, 51, and 52.

77. **II.** Rural Social Research and Surveys. — For seniors; juniors may elect. Research methods — measurements, exploration, criticism, surveys; a careful study of the scientific method as applied to social problems; the technique of investigation and research; the procedure of gathering sociological data by means of the survey; the interpretation and graphic presentation of statistical facts. Text, lectures, field and laboratory work.
3 class hours. Credit, 3.
Assistant Professor Cutler.

79. **I.** 80. **II.** 81. **III.** Seminar. — Enrolment is open to graduate students, seniors majoring in rural social science, and others especially prepared. Topics recently studied are: sociology of American colonies in the Caribbean region; success in rural leadership; rural sociology of the Old World and Far East. Courses are sequential but may be elected independently.
2 class hours. Credit, 2.
Assistant Professor Cutler.

Rural Home Life.

Professor Skinner, Assistant Professor Knowlton, Assistant Professor Tucker.

The home economics courses offered are planned to meet the needs of (1) those students who are interested in education for homemaking as an integral part of the general education of women; (2) those who wish to enter a graduate school leading to professional work; (3) those who are interested in preparing for home economics extension service, both junior and adult; (4) those who are interested in professional or vocational work in which an understanding of home economics is fundamental, such as family or community welfare work, etc.; (5) those who wish to teach home economics, in which case certain elective courses should be chosen in the Department of Agricultural Education to secure a Massachusetts teacher's certificate. Other departments offer courses planned especially for students in home economics, as follows: Mechanics of the Household, House Planning and Construction, in the Department of Agricultural Engineering; General Design in the Department of Landscape Gardening; and Food Preservation in the Department of Horticultural Manufactures.

1. **I.** INTRODUCTION TO HOME ECONOMICS. — For freshmen. Lectures on the history and evolution of the home; social customs and their value in family relationships; healthful and suitable care of the wardrobe; principles of nutrition as applied to the student's life; the student's budget, and the keeping of personal accounts.
2 class hours. Credit, 2.
Miss SKINNER.

28. **I.** 29. **II.** CLOTHING AND TEXTILES. — For sophomores. A study of the selection and purchase of suitable materials, their character and cost; appropriateness and simplicity in dress. Practical laboratory work includes designing and drafting of patterns, the use of commercial patterns, and the making and repairing of garments.
1 class hour. 3 2-hour laboratory periods, credit, 4.
Miss TUCKER.

32. **III.** APPLIED DESIGN. — For sophomores. The application of the principles of design to specific problems of everyday life, using various media for their execution.
3 2-hour laboratory periods, credit, 3.
Miss TUCKER.

50. **I.** FOODS. — For juniors. A study of foods in their scientific and economic aspects, with the preparation of simple breakfasts and luncheons.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Miss KNOWLTON.

51. **II.** FOODS. — For juniors. A further study of foods on the basis of mea planning in the home, with especial emphasis on dinners and the day's meals as a whole.
2 class hours. 2 3-hour laboratory periods, credit, 5.
Miss KNOWLTON.

52. **III.** DIETETICS. — For juniors. A study of the food requirement throughout infancy, childhood, adolescence, adult life, and old age, considering the energy value of foods and the nutritive properties of foodstuffs. Typical dietaries are planned for each period, with special regard to economic and social conditions.
2 class hours. 2 3-hour laboratory periods, credit, 5.
Miss KNOWLTON.

56. **II.** CLOTHING. — For juniors. This course aims to develop initiative, independence, and art in designing garments for figures of different types, with special emphasis on proportion, color, and texture. Laboratory work will be concerned with more difficult problems of garment construction.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Miss TUCKER.

61. **III.** House Furnishing. — For juniors. A study of the fundamental principles of furnishing a moderate-sized home from an æsthetic and an economic standpoint.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Miss Tucker.

76. **I.** Home Management. — For seniors. The application of the principles of scientific management to the household, and the elements of successful home making. The family income, cost of living, household accounts, the budget and its apportionment. The responsibility of the woman to her family and the community in establishing right standards of living.
4 class hours. 1 2-hour laboratory period, credit, 5.
Miss Skinner.

78. **II.** Health, and Home Care of the Sick. — For seniors. A study of the care of the family health; simple diseases and their prevention; the care of young children and invalids; first aid to the injured.
3 class hours. Credit, 3.
Miss Skinner.

81. **I.** The Community of the Home Economics Graduate. — For seniors. This course is intended to be a practical application of home economics to the various social, economic, industrial, and educational problems relating to the home, which the home economics graduate may meet in any community, either as an employed worker or as a volunteer. This may include a field trip to Boston and other centers at an estimated cost of ten dollars. Recommended only to those pursuing a major in home economics.
2 class hours. 1 2-hour laboratory period, credit, 3.
The Department.

82. **II.** Health Education. — For seniors. This course is intended to show how the home economics graduate fits into the health program of the school, either as a teacher or as volunteer worker. Recommended only to those pursuing a major in home economics.
2 class hours. 1 2-hour laboratory period, credit, 3.
The Department.

83. **III.** Field Problems under Supervision. — For seniors. This course is intended to be a more intensive application of home economics to special community problems and to serve as a beginning of simple research work. Recommended only to those pursuing a major in home economics.
2 class hours. 1 2-hour laboratory period, credit, 3.
The Department.

GENERAL DEPARTMENTS.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

Military Science and Tactics.

Major N. Butler Briscoe, Cav. (D. O. L.), U. S. A.; Major Eustis L. Hubbard, Cav. (D. O. L.), U. S. A.; Captain Edwin M. Sumner, Cav. (D. O. L.), U. S. A.; Technical Sergeant John J. Lee, U. S. A., Retired; Technical Sergeant James A. Warren, Cav. (D. E. M. L.), U. S. A.; and a detachment of enlisted men of the United States Army.

Under act of Congress, July 2, 1862, military instruction under a regular army officer was required of all able-bodied male students in this college. Under act of Congress, June 3, 1916, as amended by act of Congress, September 8, 1916, there was established at this college in April, 1917, an infantry unit of the Reserve Officers' Training Corps. Following the World War and an act of Congress, July 9, 1918, the Reserve Officers' Training Corps has been in operation under the regulation of the War Department, administered by the president of the college and the professor of military science and tactics. Beginning with the fall term, 1920–21, the infantry unit of the Reserve Officers' Training Corps was converted into a cavalry unit.

The primary object of the Reserve Officers' Training Corps is to provide systematic military training at civil educational institutions, for the ultimate purpose of qualifying selected students of such institutions as reserve officers in the military forces of the United States. It is intended to attain this object during the time the students are pursuing their general or professional studies, with the least practicable interference with their civil careers, by employing methods designed to fit men physically, mentally, and morally for pursuits of peace as well as war.

The course for cavalry units of the Reserve Officers' Training Corps includes theoretical and practical instruction in all phases of cavalry work, so distributed over the four-year college course as to qualify students at the end of the freshman year as privates of cavalry, at the end of the sophomore year as non-commissioned officers of cavalry, and upon graduation as reserve officers. The instruction in this department covers cavalry drill, cavalry weapons — rifle, pistol, saber, automatic rifle, and machine gun — map reading and military sketching, minor tactics, equitation, etc. The course in equitation includes cross-country riding and instruction in polo. So far as season and weather permit, instruction is of a practical nature out of doors.

All male candidates for a degree in the four-year course must take at least three hours a week of military training for two years. Students who are approved by the president and the professor of military science and tactics may take the advanced course in their junior and senior years if they so elect. The advanced course consists of at least five hours per week and a summer camp of about six weeks during the summer vacation between the junior and senior years. Students taking this course are paid by the Federal Government at a rate to be fixed by the Secretary of War, not to exceed the value of the army ration. The rate now fixed is thirty cents per day, which with all allowances amounts to about two hundred and thirty-five dollars. Students graduating in the advanced course are eligible for commissions in the Officers' Reserve Corps, but are not required to accept such commissions if offered.

The uniform furnished to the freshmen and sophomores (basic course) is of olive drab woolen cloth, and is supplied by the Federal Government without cost except for the necessary alterations. The uniforms for the juniors and seniors (advanced course) are of forest green woolen cloth, tailor-made for the individual student. A deposit of thirty dollars for this uniform is required at the beginning of the junior year. The student is reimbursed through the allowances for clothing and rations.

Required Courses.

1. **I.** 2. **II.** 3. **III.** For freshmen. Theoretical and practical instruction in courtesy and discipline, riding and drills, rifle marksmanship, cavalry equipment and arms, physical training, history, dismounted sports.

3 scheduled hours, credit, 2.
Professor Briscoe and Assistants.

25. **I.** 26. **II.** 27. **III.** For sophomores. Theoretical and practical instruction in leadership, map reading and map making, hygiene, sanitation, and first aid, cavalry equipment and arms, pistol marksmanship, riding and drill, mounted sports.

3 scheduled hours, credit, 2.
Professor Briscoe and Assistants.

Elective Courses.

50. **I.** 51. **II.** 52. **III.** For juniors. Cavalry drill and riding, leadership and command, engineering (bridges, explosives), cavalry equipment and arms, selection and care of horses and mules, communications (telephone, telegraph, radio), mounted sports, jumping, polo.

5 scheduled hours, credit, 4.
Professor Briscoe and Assistants.

75. **I.** 76. **II.** 77. **III.** For seniors. Transportation (wagon and pack), correspondence and records, law, leadership and command, drill and riding, history, mounted sports, competitions, horse-show preparation and management, polo, cross-country riding.

5 scheduled hours, credit, 4.
Professor BRISCOE and ASSISTANTS.

Physical Education and Hygiene.

Professor HICKS, Professor GORE, Mrs. HICKS, Mr. BALL, Mr. DERBY, Mr. BRIGGS.

The purpose of the laboratory courses offered by this department is to provide active exercise regularly, in order that all students may properly care for their health and maintain their physical condition throughout their college course. It is also hoped that the health and exercise habits thus established will be continued after leaving college. The course in Hygiene for men is a series of lectures designed to give to the new student the simple rules of living both as an individual and in his relations with others. The required courses for men and for women are supplemented by special lectures on social hygiene and social relations. The elective training courses are designed for those students who are majoring in Education and have athletic experience sufficient to warrant their having direction of recreation in secondary schools.

[All undergraduate male students are given a physical examination upon entering. All undergraduate women students are required to present as a part of their entrance record, a form report of a physical examination by their family physician.]

MEN.

Required Courses.

1. **I.** HYGIENE. — For freshmen. Lectures on personal hygiene.
1 class hour. Credit, 1.
Professor HICKS.

2. **I.** RECREATION. — For freshmen. Outdoor games.
2 laboratory hours, credit, 1.
The DEPARTMENT.

3. **III.** RECREATION. — For freshmen. Outdoor games.
2 laboratory hours, credit, 1.
The DEPARTMENT.

7. **I.** 8. **II.** 9. **III.** RECREATION. — Military substitute for freshman men.
3 scheduled hours, credit, 2.
The DEPARTMENT.

25. **I.** RECREATION. — For sophomores. Outdoor games.
2 laboratory hours, credit, 1.
The DEPARTMENT.

26. **III.** RECREATION. — For sophomores. Outdoor games.
2 laboratory hours, credit, 1.
The DEPARTMENT.

30. **I.** 31. **II.** 32. **III.** RECREATION. — Military substitute for sophomore men.
3 scheduled hours, credit, 2.
The DEPARTMENT.

Elective Course.

77. **III.** TRAINING COURSE. — For seniors. Election by permission only. History of physical education and supervision of athletics.
2 class hours. Credit, 2.
Professor HICKS.

WOMEN.

Required Courses.

4. **I.** RECREATION. — For freshmen. Outdoor games.
3 scheduled hours, credit, 2.
Mrs. HICKS.

5. **II.** GYMNASTICS. — For freshmen. Body mechanics, folk and national dancing, gymnastics.
3 scheduled hours, credit, 2.
Mrs. HICKS.

6. **III.** RECREATION. — For freshmen. Outdoor games.
2 scheduled hours, credit, 1.
Mrs. HICKS.

27. **I.** RECREATION. — For sophomores. Outdoor games.
5 scheduled hours, credit, 3.
Mrs. HICKS.

28. **II.** GYMNASTICS. — For sophomores. Body mechanics, folk and national dancing, gymnastics, rhythms, games.
3 scheduled hours, credit, 2.
Mrs. HICKS.

29. **III.** RECREATION. — For sophomores. Outdoor games.
5 scheduled hours, credit, 3.
Mrs. HICKS.

Elective Courses.

50. **II.** GYMNASTICS. — For juniors. Rhythmic dancing, clog dancing.
3 scheduled hours, credit, 2.
Mrs. HICKS.

76. **II.** GYMNASTICS. — For seniors. Rhythmic dancing, clog dancing.
3 scheduled hours, credit, 2.
Mrs. HICKS.

THE GRADUATE SCHOOL.

ROSCOE W. THATCHER, PH.D., LL.D., President of the College.

HENRY T. FERNALD, PH.D., Director of the Graduate School and Professor of Entomology.

GRADUATE STAFF, 1927–1928.

President THATCHER, Director FERNALD, Heads of Divisions, Heads of Departments offering graduate courses, Professors and Assistant Professors teaching graduate subjects; Dean MACHMER; R. D. HAWLEY, Secretary.

GENERAL STATEMENTS.

Graduate courses leading to the degrees master of science, master of landscape architecture, master of agriculture, doctor of agriculture, and doctor of philosophy have been available at the college for more than twenty years, and the graduate school work has been in great demand. Graduate students desiring advanced courses, but who do not wish to take advanced degrees, are also admitted.

ADMISSION.

Admission to the graduate school will be granted: —

1. To graduates of the Massachusetts Agricultural College.
2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of accepted standing, but has not taken as much of the subject he desires to select for his major study as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work in that department as the head of the department may consider necessary, without credit toward his advanced degree. In the case of minor subjects for advanced degrees, credit begins to accrue from the point where the previous training of the applicant ended, whether it be graduate or undergraduate in its rating at this college, subject however to such limitations as may be fixed by the head of the department concerned. (See department statements.)

Applications for membership in the graduate school should be presented to the director of the school. An official transcript of the applicant's collegiate record, and a statement of the graduate work desired and whether the applicant intends to study for a degree should be submitted.

Registration as a graduate student should be promptly made at the director's office and must be renewed for each term thereafter.

THE GRADUATE WORK.

Candidates for the degree of doctor of philosophy are required to prosecute three subjects, one of which shall be designated as the major and the others as minors. No two of these subjects may be taken in the same department. An original thesis shall be considered a part of the major subject.

Candidates for the degree of doctor of agriculture are required to select a major and such other subjects as will develop the major in its greatest intensity and comprehensiveness. Successful experience is also requisite, together with a thesis which represents a masterly survey or intimate study through accurate application of some phase of the major subject.

Candidates for the degree of master of science are required to prosecute two subjects, one of which shall be designated as a major and the other as a minor. When desirable, and approved by the director, the minor may be made up of subjects from more than one department. The major and minor subjects may not be selected in the same department. An original thesis is considered a part of the major subject.

Candidates for the degree of master of agriculture are allowed greater privileges in the selection of subjects, but will be required to select a major and such other supporting lines of study as will be necessary to equip the individual professionally. A thesis which will reveal the professional training of the individual will be required.

Candidates for the degree of master of landscape architecture will be expected to conform to the established courses of the department, and to the requirements of the department in the preparation of a thesis, as well as in actual experience outside the college.

Candidates for membership in the graduate school who do not desire to work for a degree may, with the approval of the director of the school, take more than one subject in the same department, or pursue work in several departments, if their preparation will permit. A statement of the subjects chosen must in each case be submitted to the director of the graduate school for approval. The chosen subjects must bear an appropriate relation to each other.

A working knowledge of French and German is important for successful graduate work in practically all the major lines offered by the college, and students not having this will be given an opportunity to acquire it along with their graduate work.

The graduate staff reserves the privilege of recommending and allowing courses in other institutions as a part of the work for advanced degrees at this college, whenever such a policy seems advisable. A certain amount of work in absentia may also be permitted, provided it is prosecuted under satisfactory direction and supervision, and regular and sufficient reports of progress are submitted.

Theses.

A thesis is required of each candidate for an advanced degree. It must be on a topic belonging to the candidate's major subject; must show that its writer possesses the ability to carry on constructive study; must be an actual contribution to knowledge; and possess real merit.

The thesis in its final form must be submitted to the director by May 15 of the year in which the student is to present himself for the advanced degree, and before he may take the required examination. Three complete copies are required. One of the copies is to be retained as an official copy by the director, one is to be deposited in the college library, and the third is to be retained by the department in which the thesis was prepared. The candidate for the doctor's degree must be prepared to defend at the oral examination the views presented in his thesis.

Final Examinations.

For the degree of doctor of philosophy or doctor of agriculture, final examinations on the minors taken are given upon the completion of the subjects. In the major subject, a written examination, if successfully passed, is followed by an oral examination in the presence of the graduate staff.

For the degree of master of science, master of agriculture, or master of landscape architecture, a final examination upon the minor taken is given upon the completion of each course, and in the major a final examination, which may be either written or oral, or both, is given over all the work by the department concerned.

Degrees Conferred.

The degrees of doctor of philosophy and doctor of agriculture are conferred upon graduate students who have met the following requirements: —

1. The devotion of at least three years[1] to the prosecution of three subjects of study and research in residence at the college.

2. The earning of not less than one hundred credits in the chief or major subject, and of not less than twenty-five credits in each of two minor subjects.

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[1] All time statements refer to minimum time.

3. The preparation of a thesis, in the major subject, constituting an actual contribution to knowledge and accompanied by drawings if necessary. For the degree of doctor of agriculture the thesis may be modified to meet professional requirements.

4. The passing of final examinations, in both the major and minor subjects, to the satisfaction of the instructors in charge.

5. A public oral examination.

6. The payment of all fees and college expenses required.

The degrees of master of science, master of agriculture, and master of landscape architecture are conferred upon graduate students who have met the following requirements: —

1. The devotion of at least one year and a half to the prosecution of study in two subjects of study and research, not less than one full college year of which must be in residence. In the case of a master of landscape architecture the student must follow the prescribed course of study.

2. The earning of not less than fifty credits in the chief or major subject, and of not less than twenty-five credits in the minor subject. Students pursuing the course in landscape architecture will devote all of their time to the established course, and meet the conditions of one year of experience outside the college.

3. The preparation of a thesis in the major subject, constituting an actual contribution to knowledge, and accompanied by drawings if necessary.

4. The passing of final examinations, in both major and minor subjects, to the satisfaction of the professors in charge.

5. The payment of all fees and college expenses required.

The fee for the degree of master of science, master of agriculture, or master of landscape architecture is $10, and for the degree of doctor of agriculture, $25.

Courses Offered.

Courses available as major subjects for the degree of doctor of philosophy: —

Agricultural Economics.
Agronomy.
Bacteriology and Physiology.
Botany.
Chemistry.
Entomology.
Horticulture.
Pomology.
Rural Sociology.

Courses available as major subjects for the degree of master of science: —

Agricultural Economics.
Agricultural Education.
Agronomy.
Animal Husbandry.
Bacteriology and Physiology.
Botany.
Chemistry.
Entomology.
Horticulture.
Mathematics and Physics.
Pomology.
Poultry Science.
Rural Sociology.
Veterinary Science.

Courses available as major subjects for the degree of master of agriculture: —

Agronomy.
Animal Husbandry.
Poultry Science.

The course in landscape architecture leads to the degree of master of landscape architecture.

Courses available as minor subjects: —

Agricultural Economics.
Agricultural Education.
Agronomy.
Animal Husbandry.
Bacteriology and Physiology.
Botany.
Chemistry.
Entomology.
Horticulture.
Landscape Architecture.
Mathematics and Physics.
Pomology.
Poultry Science.
Rural Sociology.
Veterinary Science.
Zoölogy.

GENERAL OUTLINE OF COURSES FOR ADVANCED DEGREES.

Agricultural Economics.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must have had the following courses or their equivalent: Economics and Sociology 50, Agricultural Economics 26 and 50.

REQUIRED WORK. — Candidates must take the following courses: Agricultural Economics 51, 52, 53, and 79. These courses, specially arranged for graduates, may be taken as Courses 120, 170, 155, and 180 for graduate credit. In addition, candidates must take Courses 110, 111, 130, 165, and 175 in Agricultural Economics; Rural Sociology 27 and 50, or equivalent courses; and Economics and Sociology 51 and 52, or equivalent courses.

Each candidate will be required to have a working knowledge of the general field of economics, the history of agricultural economics, the theory of agricultural economics, the problems of agricultural production, land tenure, land problems, agricultural commerce, agricultural co-operation, agricultural credit, statistics of agriculture, and prices, markets, and marketing.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — The same as for the degree of doctor of philosophy, except that there is no language requirement.

GRADUATE COURSES OFFERED.

110. THEORY OF AGRICULTURAL ECONOMICS. — Readings in French, German and English on economics of agriculture. Alternate years, odd, 200 hours.
Credit, 3.
Professor CANCE.

111. CURRENT ECONOMIC PROBLEMS AND LITERATURE. — Department seminar throughout the year. Credit, 1 each term.

120. HISTORICAL AND COMPARATIVE AGRICULTURE. — General survey. May be taken in connection with Course 51. Spring term, yearly. Credit, 3.
Assistant Professor ——.

121–122. HISTORY OF AMERICAN AGRICULTURE. — Special studies in the history of agricultural institutions, practices or relations. Fall term, even years.
Credit, 5.
Assistant Professor JEFFERSON.

130. PROBLEMS OF AGRICULTURAL PRODUCTION. — The relation of the farmer to the food supply. May be taken in connection with Course 77. Fall term, yearly.
Credit, 5.
Professor CANCE.

140. LAND TENURE AND THE ACQUISITION OF FARM LAND. — Readings, discussion, original exercises. Alternate years, even. Credit, 3–5.
Professor CANCE.

145. FARM LABOR. — Reading and investigation. Credit, 3.
Professor CANCE.

150. AGRICULTURAL COMMERCE, INDUSTRY AND TRADE. — A study of trade movements and commercial activities relating to agricultural products. Fall term, alternate years, odd. Credit, 3–5.
Assistant Professor JEFFERSON.

155. THE AGRICULTURAL MARKET. — A study of the forces, methods, and institutions of the market for agricultural products. Spring term, yearly.
Credit, 5.
Professor CANCE.

156. SPECIFIC PROBLEMS IN MARKETING FARM PRODUCTS. — Reports and discussions. Alternate years, odd. Credit, 3.
Professor CANCE.

160. AGRICULTURAL PRICES. — Winter term, yearly. Credit, 3.
Assistant Professor ——.

161. AGRICULTURAL PRICES. — Spring term, yearly. Credit, 3.
Assistant Professor ——.

165. TRANSPORTATION OF AGRICULTURAL PRODUCTS. — Elementary discussion and report. Winter term, yearly. Credit, 5.
Professor CANCE.

166. SPECIFIC TRANSPORTATION PROBLEMS. — Original study, reading, and report on certain transportation problems related to agriculture. Alternate years, odd.
Credit, 3–5.
Assistant Professor ——.

170. CO-OPERATION IN AGRICULTURE. — Elementary problems and discussion. May be taken in connection with Course 50. Winter term, yearly. Credit, 5.
Professor CANCE.

171–172. SPECIAL PROBLEMS IN CO-OPERATION FOR ECONOMIC PURPOSES. — Study, original investigation, and discussion. Every third year, beginning 1922.
Credit, 3–5.
Professor CANCE.

175. AGRICULTURAL CREDIT. — Readings and reports in addition to class lectures on agricultural credit. Taken in connection with Course 78. Spring term, yearly. Credit, 3–5.
Assistant Professor ——.

180. ELEMENTARY PRINCIPLES OF STATISTICS. — Chiefly related to agriculture. Lectures, laboratory studies and original work. Taken in connection with Course 79. Fall term, yearly. Credit, 5.
Assistant Professor ——.

181. SPECIFIC PROBLEMS IN STATISTICS OF AGRICULTURE. — Alternate years, even. Credit, 3–5.
Assistant Professor ——.

185. RURAL LAW. — Corresponds to Course 78. Spring term, yearly.
Credit, 5.
Mr. SMART.

186. STUDIES IN AGRICULTURAL LEGISLATION.
Credit, 3–5.
The DEPARTMENT.

190–195. INVESTIGATION OF VARIOUS PROBLEMS RELATED TO AGRICULTURAL ECONOMICS. — Credit given on basis of time spent and reports submitted.

200. THESIS. — Research work in agricultural economics will be developed by four principal methods, namely, historical, statistical, accounting, and general field investigation. In all instances mastery of research methods includes facility in investigation, tabulation and interpretation of results.

MINOR REQUIREMENTS.

Undergraduate prerequisites, 15 credit hours of Economics and Agricultural Economics, including the following courses or their equivalents, — Economics and Sociology 50, Agricultural Economics 26 and 50.

Required work, Courses 111, 155, and 180, or equivalent courses.

Agricultural Education.

MAJOR REQUIREMENTS.

For the Degree of Master of Science.

PREREQUISITE WORK. — A minimum of 25 undergraduate credits distributed among the following lines of study: philosophy, psychology, history of education, principles and methods of teaching, school organization and administration. Successful teaching experience will receive consideration.

REQUIRED WORK. — At least 50 credits must be earned from the following list of courses in the department or met by accepted transferred credits.

GRADUATE COURSES OFFERED.

100. HISTORY OF EDUCATION.	Credit, 1–10.
104. VOCATIONAL EDUCATION.	Credit, 1–10.
105. CURRICULUM STUDY.	Credit, 1–20.
110. RURAL EDUCATION.	Credit, 1–15.
115. VOCATIONAL TEACHER TRAINING.	Credit, 1–10.
120. THEORY AND USE OF MENTAL TESTS.	Credit, 1–20.
125. SECONDARY EDUCATION.	Credit, 1–15.
130. ADVANCED EDUCATIONAL PSYCHOLOGY.	Credit, 1–20.
135. EDUCATIONAL PHILOSOPHY.	Credit, 1–20.
140. GENERAL EDUCATIONAL RESEARCH.	Credit, 1–20.
145. TEACHING METHOD AND PRACTICE.	Credit, 1–10.
200. THESIS.	Credit, 15–25.

MINOR REQUIREMENTS.

Minor work is offered in the department for the degrees of doctor of philosophy and master of science. Candidates must have had the equivalent of 15 undergraduate credits in education.

Agronomy.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must have had undergraduate courses 25 and 27 as described in this catalogue, and should have had thorough training in the elements of the natural sciences.

REQUIRED WORK. — Studies will be assigned from the courses listed below. Thesis problems may be chosen in the subject matter of soils, fertilizers, or field crops.

For the Degree of Master of Science.

PREREQUISITE WORK. — As above.

REQUIRED WORK. — Assigned work will be selected from the courses listed below.

For the Degree of Master of Agriculture.

PREREQUISITE WORK. — The same as for the degree of master of science in so far as it is essential to establish the professional approach to agronomy, but in addition the candidate must be familiar with agronomical practices.

REQUIRED WORK. — As above.

GRADUATE COURSES OFFERED.

110. STUDIES IN THE CULTURE OF FIELD CROPS.	Credit, 1–10.
115. THE FERTILIZATION OF FIELD CROPS.	Credit, 1–10.
120. STUDIES IN HARVESTING AND STORAGE.	Credit, 1–10.
125. THE IMPROVEMENT OF FIELD CROPS.	Credit, 1–10.
130. TECHNOLOGY OF FIELD CROPS.	Credit, 1–10.
140. SOIL CLASSIFICATION.	Credit, 1–10.
145. STUDIES IN SOIL PHYSICS.	Credit, 1–10.
150. MOISTURE RELATIONSHIPS IN SOILS.	Credit, 1–10.
155. STUDIES IN SOIL MANAGEMENT.	Credit, 1–10.
160. SOIL TECHNOLOGY.	Credit, 1–10.
165. SOIL REACTION STUDIES.	Credit, 1–10.
170. STUDIES IN SOIL FERTILITY.	Credit, 1–10.
175. ORGANIC MATTER OF THE SOIL.	Credit, 1–10.
180. FERTILIZER TECHNOLOGY.	Credit, 1–10.
185. FERTILIZER AND THE SOIL.	Credit, 1–10.
190. STUDIES IN LITERATURE.	Credit, 1–10.
200. THESIS.	Credit, 15–50.

MINOR REQUIREMENTS.

Prerequisites are as stated for major work. In addition studies suited to the needs of the candidate will be selected from the above courses.

Animal Husbandry.

MAJOR REQUIREMENTS.

For the Degree of Master of Science or Master of Agriculture.

PREREQUISITE WORK. — Candidate must have had the following courses, or their equivalents, before he can enter graduate work in this department: Animal Husbandry 25, 26, 50, 52, 53, and 75. He should also be able to show evidence of experience in practical animal husbandry.

REQUIRED WORK. — At least 50 credits must be earned from the following list of courses offered by the department.

GRADUATE COURSES OFFERED.

100. ADVANCED BREED HISTORY.	Credit, 10.
110. NUTRITION OF FARM ANIMALS.	Credit, 10.
120. REPRODUCTION OF FARM ANIMALS.	Credit, 10.
200. THESIS.	Credit, 25.

MINOR REQUIREMENTS.

Minor work in animal husbandry may include undergraduate Courses 50, 53, 81 or 82, and such other work in reading and compilation of material as the instructor may outline. Written examinations will be conducted at the completion of each term's work.

Bacteriology and Physiology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidate must have had Courses 50, 51, 52, 80, 82 and 83, or their equivalents, before he can enter upon graduate work.

REQUIRED WORK. — Studies will be selected from the courses offered below. It will be the purpose of the department to distribute such studies among the courses offered in a manner to gain the greatest efficiency and a comprehensive knowledge of the entire field. The work will be conducted by prescribed readings, critical written reviews, conferences, lectures, and laboratory exercises.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — Courses of a basic and applied character selected from the courses offered below which will prepare the student for effective effort.

GRADUATE COURSES OFFERED.

100. HISTORY OF BACTERIOLOGY.	Credit, 1 –5.
110. PHYSIOLOGICAL STUDIES.	Credit, 5–20.
120. INDUSTRIAL FERMENTATIONS.	Credit, 5–10.
130. AGRICULTURAL BACTERIOLOGY.	Credit, 5–20.
140. SOIL BACTERIOLOGY.	Credit, 5–20.
150. DAIRY BACTERIOLOGY.	Credit, 5–20.
160. FOOD BACTERIOLOGY.	Credit, 5–20.

170. Hygienic Bacteriology. Credit, 5–20.

180. Physiology, Human or Animal. Credit, 5–10.

190. Lectures and Study of Literature. Credit, 1 each term.

200. Thesis. — Some microbiological problem related to agriculture, food, or public health. Distributed as may be most beneficial for research work. Time and credit by arrangement. Credit, 15–50.

Minor Requirements.

Minor work in bacteriology may consist of undergraduate Courses 50, 51, 52, and other courses designed to support the major work, from among the courses offered above. The candidate will also be required to pursue graduate Course 190, or follow a course of reading and conferences through three terms. In case the candidate has had some of these courses, he will be required to take more advanced substitute courses.

Botany.

Major Requirements.

For the Degree of Doctor of Philosophy.

Prerequisite Work. — The equivalent of certain undergraduate courses, determined by the department in the case of each student, is prerequisite.

Required Work. — Candidates will be required to take Courses 100 through 107, and 180, 190, and 200. Courses 150 through 155 may be taken for graduate credit in certain cases. The maximum number of major credits which may be earned in this way is 29.

For the Degree of Master of Science.

Prerequisite Work. — The requirements are the same as for the degree of doctor of philosophy.

Required Work. — Candidates will take Courses 100 and 101, and all courses from 102 through 107 which are given during their term of residence, also 180, 190, and 200. In certain cases Courses 150 through 155 may be taken, but not more than 20 credits may be earned in this way.

Graduate Courses Offered.

Courses 100 through 106 are lecture courses. They are given in rotation, except Courses 100 and 101, which come every year.

100. Plant Physiology. — The lectures will consider, under the nutrition of the plant: its chemical structure, absorption of various nutrient substances and their changes in the plant, assimilation and dissimilation of carbon and nitrogen by autotrophic and heterotrophic plants; under changes in the form of plants: growth and form under constant external factors, the influence of variable external and inner factors on growth, form, and development; and under plant movements: the various tropisms, nutations, etc. Supplemental demonstrations, laboratory work, and readings in the standard texts and journals. One lecture a week for 36 weeks. Credit, 3.

101. Plant Pathology. — A general consideration of the history, nature, and causes of plant disease; parasitism, predisposition, immunity, degeneration, natural and artificial infection, dissemination, epidemics, biologic strains, monstrosities and malformations, proliferation, prevention and control, economics of plant diseases. One lecture a week for 36 weeks. Credit, 3.

102. PLANT INHERITANCE. — This course is planned to give the student a comprehensive understanding of the principles and facts of plant inheritance. A study is made of plant variations, Mendel's law of heredity, the physical basis of heredity as established by chromosome behavior, pure lines, mutations, species and graft hybrids, etc. One lecture a week for 12 weeks. Credit, 1.

103. BIOLOGIC RELATIONS. — Consideration of certain phases of the morphological and physiological adaptations of plants with regard to insect visit; the rôle of thorns, hairs, tendrils, glands, etc. Various experiments are made to test out experimentally some of the existing theories concerning biologic adaptations. One lecture a week for 12 weeks. Credit, 1.

104. THE ECOLOGY OF PLANTS. — This course deals with the water, light, and temperature relations of plants, and the various adaptations in response to these factors; the various types of plant formation; the migration of plants; the competition of plants; invasion and successions of plants under varied conditions; and the various types of alternations and zonations. One lecture a week for 12 weeks. Credit, 1.

105. PHYSIOLOGICAL PLANT PATHOLOGY. — This course considers those plant diseases not due to bacterial or fungous parasites, but resulting from unfavorable physical or chemical conditions of the soil; from harmful atmospheric influences, such as too dry air, too much moisture, hail, wind, lightning, frost; from injurious gases and liquids; from lack of or too much light; from wounds. A knowledge of the normal physiology of the plant is required. Demonstrations and laboratory work will be given, together with assigned readings. One lecture a week for 12 weeks. Credit, 1.

106. HISTORY OF BOTANY. — An historical survey of the science; lives of noted botanists; history of certain culture plants, such as wheat, corn, coffee, potato, rice, and their influence on civilization; reading. One lecture a week for 24 weeks. Credit, 2.

107. METHODS IN DRAWING AND PHOTOGRAPHING FOR THESIS AND PUBLICATION. — Twelve weeks. Credit, 1–3.

108. THE COMPARATIVE ANATOMY OF GREEN PLANTS. — See undergraduate Courses 61–63.

150. SYSTEMATIC MYCOLOGY. — See undergraduate Courses 52–54.

151. SYSTEMATIC BOTANY OF THE HIGHER PLANTS. — See undergraduate Courses 58 and 59.

152. PLANT HISTOLOGY. — See undergraduate Course 55.

154. PLANT PATHOLOGY. — See undergraduate Courses 75–77.

155. PLANT PHYSIOLOGY. — See undergraduate Courses 78–80.

180. SEMINAR. — A weekly seminar for members of the department staff, graduate students, and major senior students is held, at which important botanical papers are discussed. Attendance and participation are required. Credit, 3.

190. COLLATERAL READING. — Extensive reading of botanical literature in English, German and French, designed to give the student a broad knowledge of the science, is required of all major students. Final examinations are based in part upon this reading course. Credit, 5–10.

200. THESIS. — Each major student is required to select a problem in plant pathology or physiology (in other branches at the discretion of the department) for original investigation, and the thesis must embody a distinct contribution to knowledge. An effort will be made to assign problems having some bearing on scientific and economic agriculture. The thesis work counts for not more than 50 per cent of the total number of major credits required for either degree.

MINOR REQUIREMENTS.

For a minor a student may take such of the work offered by the department as seems best suited to his major course. Courses 150 and 155 are primarily undergraduate work which may be taken for minor credit toward advanced degrees. In most cases no problem will be assigned.

Professors OSMUN, CLARK, TORREY, DORAN, and DAVIS.

Chemistry.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — The candidate must have taken undergraduate Courses 1 to 87, or their equivalent.

REQUIRED WORK. — The candidate will be required to take all the graduate courses listed below. He may also be required to spend at least one year at some other recognized institution, pursuing graduate study in chemistry. For the final examinations, questions will be selected from the entire field of chemistry, with special emphasis upon the lines of work covered by the research.

For the Degree of Master of Science.

PREREQUISITE WORK. — Courses 1 to 63 required; 75 and 80 desirable.

REQUIRED WORK. — Courses 101, 109, 110, 111, 112, 114; and 6 to 11 credits, according to the nature of the work, from courses 102, 103, 104, 105, 106, except that if the candidate has not had courses 75, 80, 86, and 87 these must be taken, and may be substituted for some of the courses 102 to 106.

GRADUATE COURSES OFFERED.

101. INORGANIC PREPARATIONS. — Laboratory. The preparation of chemical products from raw materials. The manufacture and testing of pure chemicals. The laboratory work is essentially synthetic in nature, and is designed to aid in acquiring a more adequate knowledge of inorganic chemistry than is to be obtained by chemical analysis alone. Ten to fifteen of the preparations given in Biltz's *Laboratory Methods of Inorganic Preparations* will be made by each student. Any term. Credit 3 or 5.

Assistant Professor SEREX.

102. ADVANCED INORGANIC PREPARATIONS. — Laboratory. Continuation of Course 101. Any term. Credit 3 or 5.

Assistant Professor SEREX.

103. ADVANCED ANALYTICAL CHEMISTRY. — Laboratory. This course may be taken in part as follows: (*a*) electrolytic analysis, 6 credits; (*b*) ultimate analysis, 3 credits; (*c*) special analytical work to meet the needs of the individual student, 5 credits. In addition the following subjects may be taken if desired: (*d*) fertilizers, 5 credits; (*e*) insecticides, 3 credits; (*f*) milk and butter, 5 credits. (*a*), (*b*), (*c*) may be taken any time; (*d*), (*e*), (*f*) should be taken at the time the undergraduate course is given.

Professor PETERS.

104. ADVANCED PHYSICAL CHEMISTRY. — Laboratory. Measurement of the electrical conductivity of solutions; degree of ionization; ionization constants; per cent hydrolysis of aniline hydrochloride from conductivity measurements; solubility product by the conductivity method; velocity of saponification by conductivity; neutralization point by conductivity; vapor pressure determinations; critical temperature of carbon dioxide or sulphur dioxide; transport numbers; preparation and properties of colloidal solutions; transition points by dilatometric method; heat of solution of ammonium chloride and potassium nitrate; adsorption of iodine by charcoal; determination of hydrogen ion concentration. To each student separate work will be assigned. Any term. Credit, 5.
Assistant Professor SEREX.

105. ADVANCED ORGANIC CHEMISTRY. — Laboratory. The preparation of compounds not included in Courses 51, 52, 53, such as the Kolbe synthesis of salicylic acid; benzophenone and Beckmann's rearrangement; rosaniline, malachite green, Congo red, indigo, and other dyes; synthesis of fructose; Grignard reaction. Barnett, Cain & Thorpe, Gattermann, Noyes, Fischer and other laboratory guides are used. To each student separate work will be assigned. Any term. Credit, 5.
Professor CHAMBERLAIN.

106. ADVANCED PHYSIOLOGICAL AND FOOD CHEMISTRY. — Laboratory. An intensive study of some of the more important physiological processes, physiological compounds, or food ingredients. Studies of milk, blood, urine, or other physiological factors under various metabolic and pathologic conditions. To each student separate work will be assigned. Any term.
Prerequisite, Chemistry 80. Credit, 5.
Dr. HINEGARDNER.

109. THEORETICAL OR ANALYTICAL CHEMISTRY. — Lectures. A study of the development of the electron conception of valence; the structure and size and compressibility of atoms. A general survey of the analytical process and the theory underlying. Third Term. Subjects alternate annually. Credit, 1.
Professor PETERS.

110. ORGANIC CHEMISTRY. — Lectures. Some of the following topics will be considered both theoretically and industrially: alkaloids, synthetic dyes, essential oils, terpenes, rubber, cellulose; the study of methods for carrying out general reactions; isomerism, tautomerism, condensation, etc. References: Cain & Thrope, Cohen, chemical monographs, Lassar-Cohn, Henrich, Molinari. First term. Subjects alternate annually. Credit, 1.
Professor CHAMBERLAIN.

111. ADVANCED PHYSIOLOGICAL AND FOOD CHEMISTRY. — Lectures. A study of the recent advances in this field. An intimate treatment of the more important physiological factors and their relations to health, nutrition, and growth. Second term. Subjects alternate annually. Credit, 1.
Dr. HINEGARDNER.

112. THEORETICAL AND PHYSICAL CHEMISTRY. — Lectures. A general outline of special topics selected from recent publications covering theoretical and physical chemistry. Third term. Subjects alternate annually. Credit, 1.
Assistant Professor SEREX.

114. SEMINAR. — Conferences, reports, or lectures. Each term, once a week.
Credit, 1.
Professor LINDSEY.

200. THESIS. — Research, and, in the case of a degree, the preparation of an acceptable thesis in agricultural, analytical, organic, or physical chemistry, under the direction of the professor in charge of the work. Credit determined by work done.

MINOR REQUIREMENTS.

Work may be selected from any of the undergraduate Courses 51 to 87, or any of the graduate courses for which the student is prepared. In addition, the candidate may be required to pass a final written and oral examination before the department upon his entire minor work.

Entomology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Students must have had all the undergraduate courses given at this college, or their equivalent. Opportunities to make up any deficiencies will be available while the graduate work is being carried on.

REQUIRED WORK. — The graduate courses consist of lectures on all, and laboratory work on a part, of the subjects given below, together with advanced readings, seminar work, and original research.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — A major course for the master of science degree will be about half of the courses listed below.

GRADUATE COURSES OFFERED.

MORPHOLOGY. — 101–120.

101. Embryonic development of insects and polyembryony.
102. Metamorphosis and its interpretations.
103. Advanced external and internal anatomy.
104. Insect histology and physiology.
105. Ancestry and development of insects, including fossil insects.
106. Hermaphrodites in insects.
107. Hybrids.
108. Parthenogenesis, pedogenesis, and heterogeny.
109. Chemistry and physics of insect colors.
110. Color patterns, their significance and value.
111. Luminosity.
112. Deformities.
113. Variation in insects.

ECOLOGY. — 121–140.

121. Dimorphism and polymorphism.
122. Mimicry, including concealment, protective devices, and warning coloration.
123. Architecture of insect structures.
124. Relation of insects to plant fertilization and its importance.
125. Insect products of value to man.
126. Geographical distribution and methods of distribution of insects, with consideration of life zones, barriers, etc.
127. Insect migrations.
128. Insect behavior and experimental entomology.
129. Enemies of insects.
130. Duration of life.

ECONOMIC ENTOMOLOGY. — 141–160.
141. Control methods.
142. Insect photography and methods of preparing illustrations.
143. Field work and life history investigations, with methods for keeping records.
144. Legislation about insects.
145. Studies of insecticides and their application.

SYSTEMATIC ENTOMOLOGY. — 161–179.
161. History of entomology and of classifications.
162. Lives and works of prominent entomologists.
163. Abundance of insects.
164. Important collections, public and private; their location and their value.
165. Types of insects; their significance, importance, and location.
166. Rules of nomenclature and how they are used.
167. Methods for collecting, preparing, preserving, and shipping insects.

180. SEMINAR. — Readings and reports on the current literature of entomology; monthly meetings.

190. COLLATERAL READINGS. — The best articles on the various topics in entomology are assigned for collateral readings, and are included in the final examinations.

200. THESIS. — Original research on one or several topics in morphology, ecology, economic and systematic entomology. This is expected to require from one-half to three-quarters of the total working time of the student.

MINOR REQUIREMENTS.

Minor courses will cover such parts of the work outlined above as will be most likely to prove useful in connection with the majors taken by the students, or in their future work. It is not required that such men shall have had all the undergraduate work in entomology given at this college, their credit for a minor beginning where their own undergraduate training in the subject ended.

Horticulture.

Graduate work is offered in various lines of horticulture. For the most part this is divided into the different departments which constitute the college Division of Horticulture, as follows: pomology, floriculture, landscape gardening, forestry, and market gardening. For work in these lines application should be made direct to the heads of the several departments.

Besides this work, however, opportunity is offered for graduate study in general horticulture, including topics from the several organized departments mentioned, and also questions relating to plant breeding, general evolution, propagation, manufacture of horticultural products, etc. This general work is under the direction of Professor Waugh, head of the Division of Horticulture.

Landscape Architecture.

MAJOR REQUIREMENTS.

For the Degree of Master of Landscape Architecture.

PREREQUISITE WORK. — The undergraduate courses in the college known as Landscape Gardening 50, 51, and 52, Drawing 25, 26 and 27, Horticulture 50 and 51, and Mathematics 26 and 27 will be considered prerequisite to graduate work, and any student who has not passed these courses, or their equivalent, will be required to make up such work without graduate credit.

Required Work. — Each student before he may receive the master's degree with a major in this department must convince his instructors that he has a genuine aptitude for some branch of landscape gardening, either in design, construction, or management.

The minimum period of graduate study will be one and one-half years. At least one year of this time must be spent in residence at the college. One year must also be spent in practice outside the college. The work done outside the college may be prescribed by the department, and must be fully reported to the department in writing. It is essential, further, that the candidate secure the written approval of his employers outside the college. The department may, at its discretion, require a longer period of study at the college or a longer apprenticeship outside the college.

Every student before receiving his master's degree in landscape architecture must have given some thorough and fruitful study to each of the following five departments. As far as possible these studies must be of a practical nature, *i.e.*, they must be made upon actual projects in progress of development.

1. *Theory.* — The principles of esthetics as applied to landscape architecture.
2. *Design.* — The principles of pure design and their application in landscape and garden planning.
3. *Construction.* — The practical methods of carrying out landscape plans, laying out, equipment, organization of working force, time and cost keeping, etc.
4. *Maintenance.* — Methods, organization, cost.
5. *Practice.* — Office work, drafting, estimating, reporting, charges, accounting.

While great freedom is allowed to graduate students in their plans of work, a certain portion of time will always be given to systematic courses of instruction. Courses known as Landscape Gardening 175, 176, 177, 178, 179, 180, 181, and 182 are required, and may or may not be accepted for graduate credit, at the discretion of the department.

Graduate Courses Offered.

175. Theory of Landscape Art. — Same as Landscape Gardening 75. First term.
Credit, 3.
Professor Waugh.

176. Civic Art. — Same as Landscape Gardening 76. Second term.
Credit, 4.
Professor Waugh.

177. Country Planning. — Same as Landscape Gardening 77. Third term.
Credit, 4.
Professor Waugh.

178. Architecture. — Same as Landscape Gardening 78. Third term. Given in alternate years.
Credit, 3.
Assistant Professor Harrison.

179. Construction. — Same as Landscape Gardening 79. Third term. Given in alternate years.
Credit, 3.
Assistant Professor Harrison.

180. Theory of Design. — Same as Landscape Gardening 80. First term.
Credit, 4.
Professor Waugh.

181. Estate Design. — Same as Landscape Gardening 81. Second term.
Credit, 4.
Assistant Professor Harrison.

182. Park Design. — Same as Landscape Gardening 82. Third term.
Credit, 4.
Assistant Professor Harrison.

190. THEORY. — Special studies. Credit, 2–10.
The DEPARTMENT.

191. DESIGN. — Individual problems by arrangement. Credit, 2–10.
The DEPARTMENT.

192. CONSTRUCTION. — Individual problems by arrangement. Credit, 2–10.
The DEPARTMENT.

193. MAINTENANCE. — Special studies, experimental work of assigned problems.
Credit, 2–10.
The DEPARTMENT.

194. PRACTICE. — Professional field work under supervision. By arrangement.
Credit, 2–10.
The DEPARTMENT.

195. SEMINAR. Credit, 1–5.
Professor WAUGH.

200. THESIS. — Each student before receiving the master's degree with a major in landscape architecture must present a satisfactory thesis or complete project. A thesis will consist of a careful original study of some problem in landscape architecture, presented in typewritten form with any necessary illustrations, such as photographs, diagrams, drawings, etc. A project will consist of a completed set of studies of some suitable landscape-gardening problem, such as the design of a park, a real estate subdivision, an extensive playground. Such a project will usually consist of —

(*a*) Original surveys, including topography.
(*b*) Block plans, showing original design.
(*c*) A rendered plan or plans of the main features.
(*d*) Detailed working drawings.
(*e*) Estimates of cost.
(*f*) Complete report and letter of transmittal.

Credit, 5–20.

MINOR REQUIREMENTS.

Any student electing a minor in landscape architecture will be directed to take such courses from the regular catalogue list as may seem most suitable to him. Under ordinary circumstances no other work will be given to students electing minors. In special cases, however, individual problems will be assigned and individual instruction given. These exceptions will be made in cases where, by so doing, it is possible to give the student material assistance in the plan of his major work.

Pomology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must have had the equivalent of the courses required for graduation from this college; also sufficient practical experience to enable them to understand and appreciate the problems of orchard practice.

REQUIRED WORK. — The work outlined below will be required of all candidates.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — One-half of the work outlined below, selected to meet the needs of the individual student, will be required.

GRADUATE COURSES OFFERED.

101. EXPERIMENTAL METHODS. Credit, 15–20.

A critical study of the methods of research that have been used or may be helpful in pomological work. The following topics will be considered from the point of view of the investigator in pomology.

1. Statistical methods.
2. Measures of growth and yield.
3. The conduct of plot experiments.
4. Methods of soil study in their relation to pomological research.
5. Chemical methods of pomological research.
6. Methods of physiology applicable to fruit plants.
7. Microchemistry.

102. POMOLOGICAL RESEARCH. Credit, 15–20.

A critical survey of past and current research work in pomology. Semi-weekly meetings for reports and discussions will be held. The following topics will be taken up.

1. Orchard soil management.
2. Soil fertility and fertilizers.
3. Physiology of pruning tree fruits and bush and vine fruits.
4. Fruit bud differentiation.
5. Sterility and fertility.
6. Genetics of fruit plants.
7. Climatology and winter injury.
8. Advanced morphology.
9. Spraying machinery and equipment.
10. Special practices.

103. ADVANCED LABORATORY WORK. Credit, 5–12.

Each student will be required to become familiar with the research work of the department and to have a share in it. So far as this has value as graduate work he will receive credit.

104. HISTORY OF POMOLOGY. Credit, 2–5.

The men, institutions, and other influences that have contributed to the development of the science and art of pomology.

105. HORTICULTURAL TAXONOMY. Credit, 2–3.

A study of the history and development of plant classification with special reference to horticultural plants. A study of modern classification carries with it an expression of opinion as to the evolution of cultivated plants.

106. ADVANCED SYSTEMATIC POMOLOGY. Credit, 6–10.

The principles of systematic pomology including a study of nut and subtropical fruits not usually dealt with in undergraduate courses.

200. THESIS. Credit, 40–50.

Each student will be required to carry out an original investigation of an assigned problem. In the planning, executing, and interpreting the data of this problem he must show marked ability. The results are embodied in a thesis to be passed upon by the Department and the Graduate Staff.

MINOR REQUIREMENTS.

Students taking a minor in pomology will select such of the above courses as may be suited to their needs. Certain advanced undergraduate courses may also be taken for minor credit.

Poultry Science.

MAJOR REQUIREMENTS.

For the Degree of Master of Science or Master of Agriculture.

PREREQUISITE WORK. — The postgraduate course presupposes all undergraduate work or its equivalent, together with practical experience. Without the latter, students will be unable to handle Courses 140, 150, and 160. At the discretion of the instructor in charge, graduate students may be required to pursue undergraduate courses in other departments without credit.

REQUIRED WORK. — All the courses listed below. Practical poultry work may be required, but no credit will be given for such work.

GRADUATE COURSES OFFERED.

101. READING. — A review of the entire field of poultry literature, covering books, bulletins, and special articles, is made, and a written report on one or more subjects required.

110. SEMINAR. — A critical review and a criticism of the more important experiments carried on at various stations in this and other countries; also a study of poultry conditions in foreign countries, methods of management, etc., besides a detailed study of some of the largest poultry projects in this country.

120. ANATOMY (GROSS AND HISTOLOGICAL), PHYSIOLOGY, AND SURGERY. — This course requires a careful study of the anatomy and physiology of the fowl. Special attention is given to a study of those structures concerned with practical poultry problems. Instruction in surgical technique, adapted to fowls, may also be given.

130. BREEDING. — The student will carry on such breeding experiments as time and facilities permit. He may also do work in connection with our regular experimental projects. A detailed study of the pertinent literature will be required. Animal Husbandry 53, or its equivalent, is a prerequisite.

140. FEEDING. — A study of the relation of various foods and other substances to the morphology and physiology of the bird, with special reference to such subjects as egg production, feather form and structure, condition of flesh, bone, etc.

150. BROODING. — Studies will be made upon the relation between viability and rate of growth and the following topics: type of brooder, number of chicks in brood, ventilation, humidity, sanitation, exercise, and weather conditions; also a comparison of natural methods with artificial methods of rearing chicks.

160. INCUBATION AND EMBRYOLOGY. — A number of problems of a practical, scientific, and mechanical nature relating to incubation are considered. The work in embryology is of an advanced nature, dealing with its relation to morphogenesis and heredity, and presupposes an elementary knowledge of the embryology of the chick.

170. POULTRY DISEASES AND SANITATION. — In this course a study is made of various problems in poultry sanitation, with particular reference to methods relating to the control and eradication of disease.

200. THESIS.

MINOR REQUIREMENTS.

Courses 101 and 110 are designed particularly for minors.

Rural Sociology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must present satisfactory evidence of having completed at least 10 credit hours in general sociology and 10 credit hours in general economics; or take such undergraduate courses as the department may designate, to satisfy this requirement.

REQUIRED WORK. — Candidates must take, or pass by satisfactory examination, the following courses: Rural Sociology 27, 50, 51, 52, and Economics and Sociology 26 and 75, and such courses in Agricultural Education and Agricultural Economics as may be required, not to exceed ten credit hours in each department. Candidates will be required to select from the courses listed below as graduate courses a field for investigation and intensive study. Candidates for the doctorate must take all courses listed as graduate.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — Not less than 50 credit hours will be required from the courses listed below. The department will make such selection as may best meet the interest of the individual student.

GRADUATE COURSES OFFERED.

177. FIELD WORK OF AN INVESTIGATIONAL NATURE. — Research methods employed by sociologists — measurements, exploration, criticism, surveys; scientific value of the representative sample; quantitative measurements versus observation, comparison, and correlation; the statistical method; scholarly application of research methods by members of the class.

178. RURAL SOCIAL SURVEYS. — The social survey in actual practice; the bird's eye view; the segmental survey; using the statistical method; reporting and publishing the findings.

179–181. SEMINAR. — The seminar described under Rural Sociology 79, 80, and 81. Graduate students render reports on research in which they engage, and upon selected portions of current literature. The reports serve as the basis for general discussion.

182. SOCIAL CONDITIONS OF AMERICAN RURAL LIFE. — Social and economic factors in rural progress; farm income and farm life.

183. SOCIAL CONDITIONS OF OLD WORLD RURAL LIFE. — A sociological investigation of rural life in Europe, the Orient, and the Far East; rural co-operative enterprise in Denmark; agriculture in China after one hundred twenty generations.

184. RURAL INSTITUTIONS.

185. RURAL ORGANIZATION.

186. FARMERS' ORGANIZATIONS.

187. TOWN AND VILLAGE RURAL LIFE.

188. RURAL HEALTH AND SANITATION.

189. RURAL LITERATURE.

190. RURAL GOVERNMENT AND LAW.

191. Rural Leadership. — Qualities and methods making for successful leadership in rural communities.

192. Rural Conditions in the Caribbean Region. — A sociological study of rural life and industry in the American possessions and protectorates; relation of the West Indies to the United States.

193. The League of Nations and Agriculture. — Agricultural problems in their international aspects.

200. Thesis. — Upon an approved subject, and must be a valuable contribution to knowledge. Especial stress is laid upon the feature of originality in the case of candidates for the doctorate.

Veterinary Science.

Animal Pathology.

A minor consisting of two graduate courses (10 credits) in animal pathology, together with undergraduate courses (15 credits) in veterinary science, or bacteriology and physiology (see pages 66–68) is offered by this department. This minor will be a useful preparation for anyone planning to enter a veterinary college.

120. General Pathology. — Arranged to meet the need of graduate students who have not pursued a course in general pathology. Reviews in gross and microscopic animal anatomy, followed by demonstrations and discussions on morbid anatomical phases of pathology (pathological histology). A written examination will be given at the end of the term. Winter Term. Credit, 5.

140. Laboratory Methods of Diagnosis in Veterinary Science. — This course will consider bacteriological, biochemical and serological methods now used as aids in animal pathology and in the diagnosis of animal diseases. Especial emphasis will be placed upon laboratory management, interpretation and classication of laboratory data and the relationship of laboratory work to epizootics, epidemics and the public health. A written examination will be given at the end of the term. Spring Term. Credit, 5.

Zoölogy and Geology.

Courses in zoölogy and geology may be available in connection with the fulfillment of requirements in a minor for an advanced degree. The nature of the work will vary according to circumstances, and may be intensive in a special field or of somewhat general character, depending on the student's needs and his knowledge of the particular branch of science in which he wishes to study further.

THE SUMMER SCHOOL.

The summer session offers courses of collegiate grade only. Both undergraduate and graduate courses are given, intended for school superintendents, normal school, high school, college, and university teachers, college undergraduates, and any other serious student who is suitably prepared. When satisfactorily completed, these courses carry collegiate credit.

ADMISSION.

There are no formal examinations for admission to the summer school. Undergraduate students are admitted to such courses as their preparation justifies. Admission to the graduate school will be granted to graduates of the Massachusetts Agricultural College and to the graduates of other institutions having substantially equivalent requirements for the bachelor's degree.

The following schedule of courses, given in the summer of 1927, indicates the character and extent of the work, but is subject to modification.

Education:
- Principles and Methods of Teaching.
- History of Philosophy and Practice in Education.
- Introduction to Psychology.
- Educational Psychology.
- Secondary Education.
- Special Methods in Teaching Vocational Agriculture.
- Tests and Measurements.
- Supervised Teaching.
- Experimental Psychology.
- Modern Trends in Educational Psychology.
- The Employed Teacher of Agriculture.
- Vocational Education.

Science:
- Insect Life.
- Botany for the Teacher.
- Public Health.
- Microbiology.
- First Principles of Geology and Physiography.
- Historical Geology.
- Physical Chemistry.
- Physiological Chemistry.
- General Economic Entomology.
- Beekeeping.

Horticulture:
- Modern Orchard Practice.
- Advanced Systematic Pomology.
- Horticultural Manufactures.
- Garden Design.
- Surveying and Mapping.
- Plant Materials.
- Garden Flowers and Bedding Plants.
- Types and Varieties of Garden Vegetables.
- Forest Ecology.
- Plant Physiology.

Home Economics:
- Clothing.
- Foods.
- Home Furnishing.
- Millinery.

Dramatic Presentation.

FEES.

The tuition fee for undergraduate work in the summer session is ten dollars together with a recreation fee of two dollars, and laboratory fees in certain courses.

For further information, write or apply to Roland H. Verbeck, Director of Short Courses, Massachusettts Agricultural College, Amherst, Mass.

For information concerning graduate work in the summer school, write or apply to Henry T. Fernald, Director of the Graduate School, Massachusetts Agricultural College, Amherst, Mass.

NON-COLLEGIATE COURSES OF INSTRUCTION.

TWO-YEAR COURSE IN PRACTICAL AGRICULTURE.

The Two-Year Course in Practical Agriculture was organized in 1918 to meet the demand for a short course in agriculture that might be taken by men and women who either did not possess college entrance requirements, or who, for one reason or another, were unable to take the Collegiate Course.

Since its organization, at the request of the Massachusetts Legislature, the Two-Year Course has registered over 1,000 students. There are now over 500 graduates of the course. Practically all of these are in Massachusetts or in New England, but graduates of the course are to be found in Florida, California, and many other states of the Union.

The growth of the course and the demand for more specific vocational training made necessary a reorganization of the work in 1921. As the course is now organized, the student may specialize in one of seven vocations: animal husbandry, dairy manufactures, poultry, floriculture, horticulture, pomology, and vegetable gardening. This specialization does not prevent the acquirement of a general working knowledge of other supporting subjects. A general course is also provided for women who do not wish to specialize in any one branch of agriculture, but who want to prepare for rural life.

GENERAL INFORMATION.

INSTRUCTION. — The instruction is given by the regular faculty by means of classroom teaching, laboratory exercises, and practical work. The work of the classroom is supplemented by demonstration work in the laboratory, dairy room, greenhouse, and stables, and by a six months' period of farm placement training during the spring and summer following the second term of resident instruction. The course is designed to offer plain, practical, direct information, and to establish the underlying reasons for, as well as methods employed in the various operations.

Entrance Conditions. — Students must be at least seventeen years of age and must have completed at least an elementary school course or its equivalent. They must have had six months' practical farm experience before they will be permitted to enroll for the work of the second year. This experience may be gained after the first two terms of study at the college. Application for registration must be made at least two weeks before the opening of the college year, and references furnished, to whom the college may write concerning a student's ability and general character.

The Two-Year Course is not intended for students already enrolled in high schools. Such students should finish the high school course. Students enrolled in high schools, who wish to take the course, should bring a statement, either from the principal of the high school or from the parent or guardian, requesting enrollment.

Graduates of county schools of agriculture or of agricultural departments of high schools may complete the course for a certificate in one year, if they are recommended by the Director of the school or the agricultural instructor, with the further approval of the Division of Vocational Education of Massachusetts.

Scholarship in agricultural subjects and farm experience must be satisfactory. When farm experience is deficient, the certificate may be withheld until the farm placement training of six months is completed for required credits.

CREDIT AND CERTIFICATE. — In order to obtain a certificate a student is expected to have completed satisfactorily all of the work called for in the general course which he has selected. A total of 125 credits is required for graduation, of which twenty-five credits, or one-fifth of the total, are assigned to practical training. A student failing to meet the requirements in his six months' summer training cannot be enrolled for his second year, since he is not entitled to a certificate of graduation.

One credit is given for one class hour, either recitation or lecture, per week throughout a term of twelve weeks. Each two-hour laboratory period also counts for one credit. The course calls for a minimum of twenty credits each term. Upon the satisfactory completion of the course, the student is given a certificate showing the work he has done and the grades he has obtained. **A certificate will not be issued to any student whose record shows a deficiency in any subject, including his farm placement training.** At the close of each term students receive a formal report showing the standings given in the subjects pursued by them. If a student's work is deficient in 50 per cent he may be asked to withdraw.

If a student's term mark in any subject falls below 60 per cent, or if he drops a course without the consent of the Director, he is thereby failed (F) in that subject. He shall be debarred from taking the final examination in that subject and must repeat it with the following class.

If the average of the term mark and the final examination is below 60 per cent, the student is thereby conditioned (#).

How to Enroll. — Each student is required to file with the treasurer of the college a statement, signed by the clerk of the town or city from which he enrolls, stating that the parent or guardian of the student is a resident of that town. A blank for this purpose may be obtained by addressing the Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass. Upon arrival, students will report at the office of the Director of Short Courses, located in South College, where information may be obtained in regard to board and room, schedule of classes, etc.

Student Expenses.

Tuition. — Effective in September, 1926, a tuition fee of $20 per term will be charged students, residents of Massachusetts, enrolled in the two-year course. Students who are not residents of Massachusetts are charged a tuition fee of $60 a term. The tuition charged persons not citizens of the United States is $60 a term. *Students entering from Massachusetts are required to file with the President a statement, signed by either town or city clerk, stating that the applicant's father is a legal resident of Massachusetts.*

All students entering the college for the first time in this course are charged a matriculation fee of $5, which, in event of a student leaving the institution shall, if all bills due the college are paid, be remitted, or which shall upon graduation be considered as payment for the certificate.

Laboratory Fees.

The principles observed in establishing laboratory fees are the requirement that students pay for those materials actually used which cannot be supplied by the individual, and that the laboratory fees include a charge sufficient to guard against wanton waste and breakage. Fees may be established for any course without previous announcement. At present the fees charged are as follows: —

	Per Term.
Agronomy S-1	$1 50
Agronomy S-2	2 00
Animal Husbandry S-1, S-5	1 50
Animal Husbandry S-4	1 00
Dairying S-1, S-2, S-3, S-4	3 00
Floriculture S-3, S-5	3 00
Floriculture S-6	5 00
Horticulture S-1	1 00
Horticulture S-5, S-6, S-7	1 50
Microbiology S-2	5 00
Poultry S-1, S-2, S-3, S-4, S-5	2 00
Rural Engineering S-1, S-2, S-3, S-4, S-5, S-6, S-7	1 50
Vegetable Gardening S-1, S-2	1 50

Initial Charges.

At the opening of the college year, before students are registered in their classes the following charges are payable at the treasurer's office: —

Matriculation fee (first year only)	$5 00
Board (if at college dining hall) four weeks in advance	30 00
Assessment for support of Social Union	1 50
Laboratory fees	See schedule
Student tax for support of athletics [1]	15 00
Student tax for support of non-athletic activities [1]	3 50

The necessary college expenses for two years are estimated as follows: —

	First Year.	Second Year.	Total.
Matriculation fee	$5 00	–	$5 00
Room in private houses	72 00	$108 00	180 00
Board (if at college dining hall), [2] $7.50 per week	165 00	235 00	400 00
Laundry, $.50 to $.85 a week	20 00	30 00	50 00
Laboratory fees, average	10 00	15 00	25 00
Books, stationery, and miscellaneous items	30 00	45 00	75 00
Totals	$302 00	$433 00	$735 00
Tuition (citizens of Massachusetts)	40 00	60 00	100 00
Grand total	$342 00	$493 00	$835 00

The six months' placement training between the first and second years enables a student to earn from $300 to $450, depending upon his skill and general ability, and the type of work. Of this amount $200 to $300 should be saved to apply to the expenses of the second year.

Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial obligations voluntarily assumed by students, which they should expect to meet. Chief among these are class assessments, and taxes levied for maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, etc. Such expenses vary from $15 to $30 a year. Additional financial responsibility is also assumed by students joining clubs or entering into other social activities of the college. Besides the amount necessary for clothes and traveling, the economical student will probably spend between $400 and $500 per year.

STUDENT AID.

SELF HELP. — Many students are obliged to find work of some sort to earn their way through college. It is recommended that no new student enter without having at least $250 and preferably $350 with which to pay his way until he can establish himself in some regular work. **The college does not encourage students to enter without money in the expectation of earning their way entirely.** The student will find it better either to work and accumulate money before coming to college, or to take more than two years in completing his course, or, instead, to borrow money sufficient to carry him through. No student should undertake work that interferes with his studies, and students should understand that, owing to the large number of applications for employment, no one man can receive a large amount of work at the college. A number of students find opportunities for earning money without depending upon the college to furnish them with work. Students whose deportment or class work is not satisfactory are not likely to be continued in student labor. **Opportunities for labor for Short Course men on the campus are limited to second-year men in the Two-Year Course in Practical Agriculture.** Students, therefore, may find it rather difficult to obtain all the work they desire during their first year; as a matter of fact, however, any student who is capable of doing a variety of things and who is a competent workman usually finds little difficulty in obtaining all the work that he can do from the outset.

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[1] While this is not essentially a college charge, the Treasurer of the college acts as collector for the student activity, and all students are expected to make the payment as indicated. The subscription price of the "Collegian" is fixed by the managers, the amount of athletic tax by vote of the student body.

[2] First-year students are required to take their meals in the college dining hall.

Rooms.

Students must secure rooms approved by the college. The assignment of rooms and the general supervision of the housing of students is in charge of the Director of Short Courses.

Women students are expected to occupy rooms in the college dormitory and in such houses or apartments as the college may provide, and to board at the college dining hall. No woman student will be allowed to room in a private house without a special written permission from the Director.

Student Activities.

A large number of student organizations furnish opportunity to students for work and leadership.

The Two-Year Council is composed of representatives of the first and second year classes. This body serves as general director of the conduct of the Two-Year men, and represents before the faculty the interests of this group of students.

Agricultural Opportunities for Women.

Agriculture is a field in which women are finding increasingly good opportunities. Poultry keeping, fruit growing, floriculture, dairying, truck farming, general farming — all offer favorable openings for women. In all of these branches of agriculture women are farming independently. Women are also filling paid positions, which include those of farm and estate managers and workers, garden supervisors, and workers in boys' and girls' agricultural clubs.

For the woman or girl whose home is already upon the farm, the opportunity is exceptionally good. With the help of an agricultural education there are open to her many means of increasing her own or the farm income. With the knowledge of farm life which she already possesses, and with the possibility of securing occasional help from her family, she can easily carry on and develop a profitable enterprise of her own. The Two-Year Course in Agriculture will afford to the women who wish to engage in farming the practical training which they will need to fit them for their work, and will open to them new doors of opportunity.

Women who are interested in taking agricultural courses should correspond with Miss Margaret Hamlin, who acts as agricultural counselor for women. Women interested in home economics should address Miss Edna L. Skinner.

Positions.

The college does not guarantee positions to students registered in any of its courses, but it has an opportunity to recommend students for a large number of positions. A record is kept of each student's work, of his farm experience, and of his success in positions for which he has been recommended after he has finished his course. The opportunities for trained men and women, especially those who have had farm experience, are exceptionally good.

A student desiring a recommendation from the college must meet the following conditions: —

(1) He must be of good character.
(2) His previous record must be good.
(3) His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of farm experience cannot, as a rule, be recommended for positions of responsibility. This is especially true of the better positions as managers or superintendents.

TWO-YEAR COURSES OF INSTRUCTION.

The non-collegiate, two-year course in practical agriculture consists of five terms of vocational training in one of the following fields: animal husbandry, dairy manufactures, poultry husbandry, floriculture, horticulture, pomology, and vegetable gardening. A special course is also provided for women. The instruction in these departments is supplemented with suitable work in other supporting subjects, together with the season of placement training, between the first and second years of classroom work. For details of the courses of instruction, including farm placement training, see the following tables and the description of courses.

Table of Two-Year Subjects.

[The symbols S-1, S-2, etc., indicate the numbers of the courses and refer to the course statements in the descriptive section.]

ANIMAL HUSBANDRY.

YEAR.	Term I.	Term II.	Term III.
First.	Agronomy S-1. Animal Husbandry S-1. Dairy S-1. Poultry S-1. English S-1 [1] Tractor Practice (Required).	Animal Husbandry S-2. Agricultural Engineering S-2. Bacteriology S-1. Business Law S-1. Milking, Harnessing, and Teaming (Required).	Six months' farm placement training. (See page 146.)
Second.	Animal Husbandry S-3. Agricultural Engineering S-1. Agricultural Engineering S-3. Agricultural Engineering S-7. Rural Sociology S-1.	Animal Husbandry S-4. Agricultural Economics S-1. Farm Management S-1. Pomology S-7. Animal Husbandry S-7. (Elective). Forestry S-1 (Elective).	Animal Husbandry S-5. Agronomy S-2. Vegetable Gardening S-6. Veterinary Science S-1. English S-3. [1]

[1] See description of course.

DAIRY MANUFACTURES.

YEAR.	Term I.	Term II.	Term III.
First.	Agronomy S-1. Animal Husbandry S-1. Dairy S-1. Poultry S-1. English S-1. [1]	Agricultural Engineering S-1. Animal Husbandry S-2. Bacteriology S-1. Business Law S-1.	Six months' farm placement training. (See page 146.)
Second.	Dairy S-2. Bacteriology S-2. Rural Sociology S-1.	Dairy S-3. Agricultural Economics S-1. Farm Management S-1.	Dairy S-4. Agricultural Engineering S-5. Veterinary Science S-1. English S-3. [1]

[1] See description of course.

POULTRY.

YEAR.	Term I.	Term II.	Term III.
First.	Agronomy S-1. Animal Husbandry S-1. Dairy S-1. Poultry S-1. English S-1. [1] Tractor Practice (Required).	Poultry S-2. Agricultural Engineering S-2. Bacteriology S-1. Business Law S-1. Milking, Harnessing, and Teaming (Required).	Six months' farm placement training. (See page 146.)
Second.	Poultry S-3. Poultry S-7. Agricultural Engineering S-3. Agricultural Engineering S-7. Rural Sociology S-1.	Poultry S-4. Agricultural Economics S-1. Farm Management S-1. Pomology S-7.	Poultry S-5. Agronomy S-2. Entomology S-1. Vegetable Gardening S-6. English S-3. [1]

[1] See description of course.

FLORICULTURE.

YEAR.	Term I.	Term II.	Term III.
First.	Agronomy S-1. Floriculture S-1. Pomology S-7. Vegetable Gardening S-1. English S-1.[1] Tractor Practice (Required).	Floriculture S-2. Agricultural Engineering S-4. Agricultural Engineering S-7. Business Law S-1. Horticulture S-1. Teaming and Harnessing (Required).	Six months' farm placement training. (See page 146.)
Second.	Floriculture S-3. Floriculture S-5. Floriculture S-6. Horticulture S-12.	Floriculture S-4. Horticulture S-2. Rural Sociology S-1. Vegetable Gardening S-4.	Floriculture S-7. Horticulture S-3. Horticulture S-8. English S-3.[1] Agricultural Engineering S-2 or Entomology S-1.

[1] See description of course.

HORTICULTURE.

YEAR.	Term I.	Term II.	Term III.
First.	Agronomy S-1. Floriculture S-1. Pomology S-7. Vegetable Gardening S-1. English S-1.[1] Tractor Practice (Required).	Horticulture S-1. Horticulture S-2. Agricultural Engineering S-2. Business Law S-1. Teaming and Harnessing (Required).	Six months' farm placement training. (See page 146.)
Second.	Horticulture S-4. Horticulture S-12. Pomology S-8. Horticulture S-7 or Horticulture S-9.	Horticulture S-5. Horticulture S-10. Horticulture S-13. Forestry S-1.	Horticulture S-3. Horticulture S-6. Floriculture S-7. English S-3.[1] Horticulture S-8 or Horticulture S-11.

[1] See description of course.

POMOLOGY.

YEAR.	Term I.	Term II.	Term III.
First.	Agronomy S-1. Floriculture S-1. Pomology S-1. Vegetable Gardening S-1. English S-1.[1] Tractor Practice (Required).	Pomology S-2. Agricultural Engineering S-4. Agricultural Engineering S-7. Business Law S-1. Horticulture S-1. Teaming and Harnessing (Required).	Six months' farm placement training. (See page 146.)
Second.	Pomology S-3. Pomology S-4. Dairy S-1. Horticultural Manufactures S-1.	Agricultural Economics S-1. Rural Sociology S-1. Animal Husbandry S-6.[2] Forestry S-1.[2] Horticultural Manufactures S-2.[2] Poultry S-6.[2]	Pomology S-5. Pomology S-6. Agricultural Engineering S-2.[2] Agronomy S-2.[2] Entomology S-1.[2] Horticultural Manufactures S-3.[2] English S-3.[1]

[1] See description of course.

[2] Elect two subjects.

VEGETABLE GARDENING.

YEAR.	Term I.	Term II.	Term III.
First.	Agronomy S-1. Floriculture S-1. Pomology S-1. Vegetable Gardening S-1. English S-1.[1] Tractor Practice (Required).	Vegetable Gardening S-2. Agricultural Engineering S-4. Agricultural Engineering S-7. Business Law S-1. Pomology S-2. Teaming and Harnessing (Required).	Six months' farm placement training. (See page 146.)
Second.	Vegetable Gardening S-3. Horticultural Manufactures S-1. Pomology S-3. Pomology S-4.	Vegetable Gardening S-4. Rural Sociology S-1. Agricultural Economics S-1.[2] Horticultural Manufactures S-2.[2] Poultry S-6.[2]	Vegetable Gardening S-7. Agricultural Engineering S-2. Pomology S-5 or Pomology S-6. Entomology S-1 or Horticultural Manufactures S-3. English S-3.[1]

[1] See description of course.

[2] Elect two subjects.

GENERAL COURSE FOR WOMEN.

YEAR.	Term I.	Term II.	Term III.
First.	Agriculture S-1. Agronomy S-1. Floriculture S-1. Home Economics S-1. Physical Education S-1. English S-1.[1]	Home Economics S-2. Home Economics S-3. Bacteriology S-1. Horticulture S-1. Physical Education S-2 (Required).	Six months' farm placement training. (See page 146.)
Second.	Agricultural Engineering S-8. Dairy S-1. Horticultural Manufactures S-1. Rural Sociology S-1. Physical Education S-3 (Elective).	Home Economics S-4. Animal Husbandry S-6. Pomology S-7. Poultry S-6. Horticultural Manufactures S-2.[2] Physical Education S-4.[2]	Home Economics S-5. Horticultural Manufactures S-3. Vegetable Gardening S-6. Entomology S-1 or Poultry S-5. English S-3.[1]

[1] See description of course.

[2] Elective.

Description of Courses.

[Heavy-faced Roman numerals indicate the term in which the course is given.]

ANIMAL HUSBANDRY.

The animal husbandry course fits students to cope with the practical problems of live-stock production and management. It supplements and supports but does not duplicate or replace the necessary experience gained only through actual manual work in caring for animals. As a foundation, the study of breed history, live-stock trends, animal anatomy and physiology is required. Special attention is given to physiological processes in breeding and feeding. Later courses show how these processes actually function under the stockman's guidance. Graduates from the animal husbandry major secure for the most part positions as herdsmen or farm managers.

Animal Husbandry S-1. I. Types and Breeds.

Includes a study of the history and development of the various breeds of cattle, horses, sheep, and swine, together with a discussion of the conditions to which each breed seems best adapted. Laboratory work consists of judging and evaluating as many rings of all the classes of farm live stock as time will permit. Textbook, Plumb's *Types and Breeds of Farm Animals.*
3 class hours. 2 2-hour laboratory periods, credit, 5.

Animal Husbandry S-2. II. Principles of Feeding.

A study of the fundamental principles of animal nutrition, and of the composition of feeding materials and their relative importance for the different classes of farm animals in New England. The latter part of this course is devoted to a study of feeding standards and to the calculation of rations for all classes of farm live stock. Textbook, Henry and Morrison's *Feeds and Feeding.*
5 class hours. Credit, 5.

Animal Husbandry S-3. I. Feeding Practice.

A continuation of Course S-2, showing the application of the principles of nutrition in economic live-stock production, and including the management and feeding of horses, cattle, sheep, and swine of all ages. Feeding and managerial problems are assigned for outside work, followed by ample classroom discussions. Textbook, Henry and Morrison's *Feeds and Feeding.*
5 class hours. Credit, 5.
Prerequisites, Animal Husbandry S-1 and S-2.

Animal Husbandry S-4. II. Animal Breeding and Herd-Book Study.

Includes a study of the physiology of reproduction, and of animal genetics as well as the art of breeding. Among the topics included are the Origin and Domestication of Farm Animals; Modern Theories of Heredity, Variation, and Sex Determination; the Systems of Breeding — cross, out, line, and close breeding; and the one paramount problem of animal breeding, namely, Selection. Consid-

erable pedigree work in the student's favorite breed is also included. Textbook, Rice's *Breeding and Improvement of Farm Animals*.
4 class hours. 1 2-hour laboratory period, credit, 5.
Prerequisites, Animal Husbandry S-1 and S-2.

Animal Husbandry S-5. III. Live-Stock Management, Stock Judging, and Equitation.

The first half of the term will be devoted to practical work in handling, fitting, and judging live stock. The last half of the term will be devoted to lectures covering the feeding, selection, and management of riding or cavalry horses, and practice in riding. The riding practice will consist of drills on the military field and of cross-country trips, by arrangement with the Military Department.
5 2-hour laboratory periods, credit, 5.
Prerequisites, Animal Husbandry S-1, S-2, S-3, and S-4.

Animal Husbandry S-6. II. General Animal Husbandry.

This course consists of a general study of animal husbandry; types and market classes of live stock; breeds of farm animals; principles and practice of feeding; live-stock breeding; management of herds, flocks, and studs. Laboratory work is given in live-stock judging and management. As much detail of this broad subject is given as is consistent with time allotted. Textbook, Plumb's *A Study of Farm Animals*.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Animal Husbandry S-7. II. Farm Meats.

This course is the complement of the production course previously given, and permits the student to follow the product (beef, pork, veal, and lamb) through the farm barn and feed lot to its final destination, the consumer's table. Practice is afforded in the killing, cutting, and curing of beef, pork, veal, and lamb. Included in this course is a trip to several large packing houses in Boston, lasting two days and costing about twenty dollars. Textbook, Tomhave's *Meat and Meat Products*.
1 class hour. 1 4-hour laboratory period, credit, 3.
Prerequisites, Animal Husbandry S-1, S-2, and S-3.

NOTE. — Every student in this course must qualify in tractor practice, milking, harnessing, and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put in placement training who has not satisfied these preliminary requirements.

DAIRY MANUFACTURES.

The dairy manufactures course is designed to fit men for positions with market milk concerns, creameries, ice-cream factories, and specialized dairy farms.

Dairy S-1. I. General Dairy.

This course takes up the question of the importance of dairying in the United States, and especially in the New England States, giving the development of dairying from the earliest to the present time. It covers the secretion, composition, and properties of milk; reasons for variation in the per cent of fat in different samples of milk; the Babcock test for fat in milk and other dairy products; other common milk tests; the advantage of testing herds, cow test associations, advanced registry work; the handling of market milk; soft cheese making, ice-cream making, and butter making as applied to general farm conditions. The laboratory work consists mainly in testing milk and dairy products for butter fat, solids, and acidity, together with some laboratory work in milk handling, butter making, cheese making, and ice-cream making.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Dairy S-2. I. Ice-cream Making.

In this course a careful study is made of modern methods of manufacturing the common frozen dairy products — ice cream, sherberts, and ices, also frozen puddings, punches, mousses, etc. The lecture work includes a discussion of the history of ice-cream making, the ingredients found in ice cream, methods of preparing and standardizing mixes, the freezing process, methods of hardening, marketing, and distribution of the finished product. The laboratory work involves the preparation and standardization of ice-cream mixes, the freezing of ice cream and other frozen dairy products, and laboratory tests for butter fat and total solids in ice cream.
4 class hours. 3 3-hour laboratory periods, credit, 9.

Dairy S-3. II. Market Milk.

This course takes up the history of market milk, its food value and use. Attention is given to the necessary essentials in producing a clean product; the economics of milk production; the advantages of co-operative milk producers' organization; the various methods of marketing milk; clarification; pasteurization; cooling, etc. The laboratory work consists in visiting dairy herds and city milk plants, and the operation of machinery used in connection with market milk work.
4 class hours. 3 3-hour laboratory periods, credit, 9.

Dairy S-4. III. Butter Making and Other Dairy Products.

A large part of this course consists of the study of butter making; other products are, cheese and "surplus products." Under butter making the principal factors studied are: methods of separating milk, the history, selection, care, and use of separators; the pasteurization and ripening of cream; testing cream for acidity; the making and use of starters; churns and churning; modern methods of making butter; marketing butter; tests for moisture, salt, fat, and curd content of butter. Lectures are given covering the manufacture of other milk products — cheese, commercial buttermilk, casein, condensed milk, milk powder, etc. The manufacture of hard and soft cheeses (cheddar, pimento, olive, nut, Neufchâtel, cottage, etc.) is considered, either from the standpoint of marketing the entire milk supply of the dairy through these products, or the economic disposal of surplus milk. The laboratory work covers the operation of separators and churns, the making of butter, cheese, commercial buttermilk, etc.
4 class hours. 3 3-hour laboratory periods, credit, 9.

POULTRY HUSBANDRY.

Seven courses are offered by this department. One is a general course designed particularly to equip the student with the fundamental principles underlying successful poultry keeping as related especially to the farm flock. The other six courses are for the student who desires to specialize in poultry culture. In addition to the actual practice work performed, the student has an opportunity to keep under observation practical experiments and demonstrations continually under way for the instruction of students and practical poultry keepers.

Poultry S-1. I. Judging and Housing.

This course embraces a study of the various economically important types and breeds of domestic fowl, judging for egg production capacity and for exhibition quality. A visit to one Connecticut Valley poultry show may be required. This course also covers the principles and practices of constructing and equipping houses on a commercial poultry farm.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Poultry S-2. II. Incubation and Brooding.

A study of incubation and brooding is made by means of the operation of standard incubators and brooders and through a consideration of basic principles. Students select and grade hatching eggs, complete a hatch in small incubators, and run mammoth incubators for a period of time. Under supervision, each student has charge of a brood of chicks.
2 class hours. The equivalent of 3 2-hour laboratory periods, credit, 5.

Poultry S-3. I. Feeding and Marketing.

A study of the common poultry feeds, feeding principles, and successful commercial farm practices. For organized practice, the feeding and management of a pen of birds for a few weeks will be required. This course also covers candling, grading, and packing eggs, market classification of poultry and eggs, judging eggs, fattening, killing, dry and scald picking, drawing, shaping, and packing poultry, judging of live and dressed market poultry, the requirements of various markets, and relative merits of different systems of marketing. Each member of the class is required to fit entries for the Annual Market Poultry Show.
4 class hours. 2 2-hour laboratory periods, credit, 6.

Poultry S-4. II. Poultry Breeding.

The course includes the study of the improvement of poultry by means of mass selection, "seed-plot" and pedigree methods of breeding. Students follow through each step of a pedigree hatch and assist in the selection of the breeders used at the college plant. Basic principles of heredity necessary for an understanding of good breeding practices are studied.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Poultry S-5. III. Poultry Farm Management.

In this course the following points are given special attention: lines upon which a well-organized poultry farm is developed, the general arrangement of plots and buildings, record keeping, accounting and advertising, and a study of surveys. A trip covering two or three days will be made to representative successful poultry farms. The expense per student is approximately fifteen dollars. This trip is required of each student taking the course for credit.
4 class hours. The equivalent of 1 2-hour laboratory period, credit, 5.

Poultry S-6. II. General Poultry Course.

Poultry keeping as a national industry; its importance and geographical distribution; opportunities and possibilities in poultry culture in Massachusetts; principles of feeding; utility classification of fowl; incubation, both natural and artificial; the production and packing of hatching eggs; the baby chick industry; and brooding and rearing. Practical exercises will be closely correlated with the breeds and varieties, studies of various types and sizes of incubators, brooders, and brooder houses. Students who take Course S-6 must get permission from the Poultry Department to take advanced poultry courses.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Poultry S-7. I. Poultry Sanitation and Disease Control.

This course aims to acquaint the student with the normal hygienic conditions under which our domestic poultry thrive best. Sufficient anatomy and physiology will be given to enable the student to distinguish between normal and abnormal conditions. The nature of disinfectants and external and internal antiseptics will be stressed and the students made acquainted with the best usages, both scientific and practical, in conducting a sanitary program for disease prevention and control. A special effort will be made to link the sanitary, hygienic, and disease

control problems with the so-called down-to-date practices in feeding, housing, and general management.
2 class hours. 3 2-hour laboratory periods, credit, 5.

Note. — Every student in this course must qualify in tractor practice, milking, harnessing, and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put in placement training who has not satisfied these preliminary requirements.

FLORICULTURE.

Students who complete the course in floriculture are fitted primarily for work in commercial and private estate greenhouse establishments and retail flower stores. After gaining experience, such students may be able to start in business for themselves. With the courses in general horticulture, they should also be qualified for positions on private estates, in parks, or in nurseries.

Floriculture S-1. I. Garden Flowers and Bedding Plants.

This course is intended for students who will take up private estate work or who will specialize in floriculture. It will include a study of the annuals, biennials, herbaceous perennials, and bedding plants which are commonly used in commercial floriculture and in private estate work. Methods of propagation, culture, and uses will be considered. Laboratory exercises will include work in propagation, planting, study of materials, and planning of beds and borders.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Floriculture S-2. II. Greenhouse Construction, Heating, and Management.

This course will take up the origin, growth, and importance of the floriculture industry; development of the greenhouse; types of houses and construction; methods of greenhouse heating; general principles of greenhouse management, including soils and their preparation, fertilizers, watering, ventilation, and fumigation; methods of propagation for plants grown under glass. Trips are taken to visit greenhouse establishments in the vicinity of Amherst, at a total approximate cost of two dollars. Textbook, White's *Principles of Floriculture.*
3 class hours. 2 2-hour laboratory periods, credit, 5.

Floriculture S-3. I. S-4. II. Commercial Floriculture.

Courses S-3 and S-4 will be devoted primarily to a consideration of the important commercial crops. Special attention will be given to the culture (under glass) of roses, carnations, chrysanthemums, violets, and sweet peas. Other cut-flower crops and various potted plants will also be considered. All members of the class are required to take a one-day trip to visit a large commercial greenhouse establishment at an approximate cost of five dollars each. Textbooks required during the two courses will be: Holmes' *Commercial Rose Culture*, Smith's *Chrysanthemum Manual.*
3 class hours. 2 2-hour laboratory periods, credit, 5.

Floriculture S-5. I. Conservatory Plants.

A study of the plants, both foliage and flowering, which are used in conservatories and in decorative work. Methods of propagation, culture, uses, and identification of plants will be included in the work. Trips are taken, at slight expense, to visit the conservatories at Smith and Mount Holyoke Colleges.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Floriculture S-6. I. Floral Arrangement.

A study of the principles underlying the use of flowers in funeral designs and sprays, table decorations, corsages, vase, bowl and basket arrangements; decorations for public functions; study of color with regard to such work. Limited to

students who are majoring in floriculture. Textbooks: White's *Principles of Flower Arrangement;* Harry's *Manual of Floral Designing.*
3 class hours. 2 2-hour laboratory periods, credit, 5.

Floriculture S-7. III. The Use of Herbaceous Plants.

This course is a continuation of Floriculture S-1 and is intended for students specializing in floriculture and general horticulture. It provides opportunity for a more detailed study of many of the plants considered in the preceding course, with especial emphasis on their uses in gardens and in other types of landscape planting. Lectures, assigned readings, study and identification of plants, planning of borders and gardens.
3 class hours. 1 4-hour laboratory period, credit, 5.

Note. — Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

GENERAL HORTICULTURE.

The object of this course is to train men for positions as superintendents or foremen on parks or on private estates, or as foremen for landscape gardeners, or for private practice in horticulture service, including so-called tree surgery, city forestry, and golf grounds.

Horticulture S-1. II. Plant Propagation.

This course sets forth the principal and best methods used in reproducing and increasing the number of those plants cultivated in the various branches of horticulture.
4 class hours. 1 2-hour laboratory period, credit, 5.

Horticulture S-2. II. Plant Materials.

The object of this course is to learn to know the trees, shrubs, and vines used in ornamental plantings. Special consideration will be given to their individual characteristics as indicated in their fruits, dormant twigs, and habits of growth.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Horticulture S-3. III. Plant Materials.

A continuation of Course S-2, giving special attention to the foliage characters of evergreens; also a study of the association of various species of plant materials in group plantings.
3 class hours. 1 4-hour laboratory period, credit, 5.

Horticulture S-4. I. Principles of Plane Surveying.

Outdoor practice in the use of simple surveying instruments, as tapes, compasses, and levels used in the measurement of land surfaces. Lectures will include explanation of construction and theory of instruments.
3 class hours. 1 4-hour laboratory period, credit, 5.

Horticulture S-5. II. Drawing and Mapping.

This course deals with practice in elementary drafting, using various types of instruments and materials. Use will be made of the notes taken in Course S-4, in the study of contour maps, grading plans, house lots, and gardening problems. Practice will be given in the reading and interpretation of typical maps and plans.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Horticulture S-6. III. Surveying and Plan Making.

In this course there will be an application of the methods studied in Courses S-4 and S-5 to the mapping of small areas, house lots, garden and park areas,

road and walk construction, staking out areas from plans, grading work, and simple garden construction problems.
3 class hours. 1 4-hour laboratory period, credit, 5.

Horticulture S-7. I. Park and Estate Maintenance.

The work of this term will deal with construction and maintenance of roads and walks, especially such roads as are typical to parks and estates, proper foundations and drainage being emphasized; systems of cost keeping for parks and estates, and actual cost records analyzed; relationship between superintendent and laborer; and the entire problem of lawn grass seed, illustrated by growing plots of the more common varieties. Throughout the term there will be laboratory exercises pertinent to the typical fall problems. A one-day excursion to estates in Berkshire county is required, with an estimated expense of five dollars.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Horticulture S-8. III. Construction and Maintenance.

In addition to the routine spring problems, special emphasis will be placed upon the proper cultural methods for lawn building and maintenance. A careful study of all equipment will be made during this term.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Horticulture S-9. I. Golf Course Maintenance.

While this course will not teach golf course designing, the fundamentals of good designs will be carefully studied. Fall maintenance problems will be practised and studied.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Horticulture S-10. II. Golf Course Maintenance.

This is a practical course for greenskeepers and includes seeding, drainage, soils, costs, water systems, grasses and grass seed, and equipment.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Horticulture S-11. III. Varieties of Greens Grasses and their Culture.

The identification of grasses in turf will be required. The effects of fertilizers on various grasses will be studied and fertilizer methods practiced. Two putting greens will be put into playing condition and maintained. Two large demonstration plots will be used in connection with this course. A two-day excursion to the eastern part of the state is required, to visit golf courses and greenskeepers. Estimated expense, fifteen dollars.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Horticulture S-12. I. Care of Plant Materials.

This course deals with the care of woody ornamental plants under the following heads: planting, pruning, maintenance of soil fertility, winter protection, and tree-surgery.
3 class hours. 1 4-hour laboratory period, credit, 5.

Horticulture S-13. II. Plant Breeding.

This course considers the origin of cultivated plants, the problems and methods of the plant breeder in the improvement of horticultural varieties, and some of the basic principles of inheritance on which plant improvement is based.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Note. — Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

POMOLOGY.

This course is arranged to give the student a sound practical knowledge of fruit growing and allied subjects. Practical work in the orchards under expert supervision is emphasized where possible. It is intended to familiarize students with the best methods that have been devised by experiment stations and leading fruit growers for the production and marketing of high-quality fruits under New England conditions.

Pomology S-1. I. Orchard Production.

This course covers the planting and development of young orchards and the management of bearing plantations to produce high-grade fruit. Sites and soils for each of the tree fruits are discussed and the preferences of certain varieties for particular types of soils are studied, to guard against serious mistakes in planting. The best methods are considered for laying out orchards and for setting trees to insure a proper start. The handling of young trees to bring them into early profitable bearing is given special attention. The culture of bearing plantations is studied in detail to give an understanding of the factors that influence yields and quality of fruit. Methods of soil management are discussed with their adaptation to common soil types and with reference to their advantages and limitations. The experimental plots afford exceptional opportunities to study cultural methods, and many subjects are discussed in the orchards.
5 class hours. Credit, 5.

Pomology S-2. II. Orchard and Vineyard Pruning.

Fruit plantations may be damaged more by unintelligent pruning than by mismanagement in any other single operation. If the orchardist does not know that apple trees bear on spurs, he is very likely to cut them off in pruning, and so reduce his chances for a crop. If he is ignorant of the fact that the peach bears on last year's wood, he may remove most of this wood, and incidentally most of his crop. This course aims to give the student a thorough training in the theory of pruning and the methods of bearing of the different fruits. At the same time, every student is required to prune in the college orchards and vineyards until he becomes reasonably proficient with each kind of fruit.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Pomology S-3. I. Harvesting, Packing, Storing, Marketing.

Handling the crop to the best advantage is one of the most important things in successful fruit growing and one which too often is badly managed because the fundamental principles are not understood. The proper time for harvesting is discussed in this course, as well as the most satisfactory methods to insure a maximum storage season. Particular attention is given to packing apples in boxes and barrels, and practice is continued under supervision until the principles are mastered. Many other packages are packed and studied also in relation to the movement of the New England apple crop. The principles of common and refrigerated storage are considered in detail and storage house construction under New England conditions is discussed, with a critical examination of several storages in use on or near the campus. The competitive position of New England in the apple market is studied in relation to market demands, and attention is given to export markets and to cities outside of New England. Modern methods of marketing are considered with special reference to developing local markets and to co-operation in handling New England apples.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Pomology S-4. I. Fruit Varieties.

One of the most prolific causes of failure in the fruit business is the growing of wrong varieties: varieties requiring a dry soil are set in a wet soil; tender varieties

are set in a wet soil or where only hardy ones should be used; quality, productiveness, and season of ripening are ignored; and varieties are set which might be excellent in Ohio or Virginia or Missouri, but which cannot be grown profitably in Massachusetts. This course aims to lay the foundation for a better state of things. The student is given a thorough drill on varieties of different fruits, and has an opportunity to test personally many of the leading varieties, especially of apples.
5 class hours. Credit, 5.

Pomology S-5. III. Spraying.

In this course a careful study is made of modern methods of spraying. All the principal spray materials are studied, and the student is given practice in their preparation for use, and in applying them to the orchard. Students are required to study the construction of modern spraying apparatus, from bucket pumps to large power outfits, and to operate them in the orchards. Spraying is very properly regarded as one of the most important operations in connection with growing fruit, and it is the aim of this course to train students to recognize the work of our common orchard pests, to prepare the proper materials for their control, and to apply them efficiently.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Pomology S-6. III. Orchard Management and Small Fruits.

The work in orchard management includes a detailed study of such questions as the planning and laying out of fruit plantations so that they may be handled most economically; the cost of various operations, and methods of reducing expenses; efficient handling of labor on fruit farms; the use of labor-saving devices in fruit work; the most economical units in fruit production. While orcharding will always be the leading phase of fruit growing in Massachusetts, there are many unusual opportunities for success in growing the various small fruits. This course will deal with the problems of establishing and handling successfully plantations of strawberries, raspberries, blackberries, currants, gooseberries, and grapes, and will include such questions as the choice of varieties, the best types of soil, laying off and setting the plantation, the proper fertilization, and methods of pruning and training. The college has large plantations of most of these fruits, so that the student has ample opportunity for a wide range of practical work. The aim is to make the course of the utmost practical value, as well as to give the scientific principles on which practices are based. Each student must be prepared to take a trip to one of the fruit sections of the northeastern United States, at a cost of fifteen to twenty-five dollars.
4 class hours. 1 2-hour laboratory period, credit, 5.

Pomology S-7. I and II. General Course.

This course is intended to meet the needs of students in the animal husbandry and poultry majors, who cannot devote more than one term to the subject of pomology. The course deals with the practical side of the growing and marketing of fruits. Special attention is given to such questions as selection of site for the plantation, choice of varieties, grafting and budding, spraying, pruning, cultivation and cover crops, fertilizing the fruit plantation, packing and marketing.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Pomology S-8. I. Small Fruits.

This course is designed for those students who are not majoring in pomology but wish to make a special study of the various small fruits. The course will include a detailed study of strawberries, raspberries, blackberries, currants, and grapes, dealing with all the essential problems in establishing and maintaining such plantations, including such questions as the choice of site, selection of varieties, setting the plants, fertilizing, pruning, spraying, culture, harvesting, and

marketing. The student will be given actual practice in all the operations studied, so that he may become familiar with the practical details of handling such fruits.
5 class hours. Credit, 5.

Note. — Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

VEGETABLE GARDENING.

The two-year course in vegetable gardening is designed to prepare men to go into business for themselves as market gardeners, truck farmers, and greenhouse vegetable growers. For those whose principal interest may lie in other fields of agriculture the course has much to offer along the lines of special crops, often spoken of as cash crops. For those who wish to work for someone else, this course offers training such that its graduates are being placed in responsible positions with commercial vegetable growers, seed growers, and on private estates.

Vegetable Gardening S-1. I. Garden Farming.

Students will find this course one which will fit them to carry on estate work, to make the best use of the farm home garden, or to go on with commercial vegetable growing. The student will work with the leading types of the common vegetables, learning their requirements. Special attention will be given to the harvesting and storage of crops for winter, and to fall preparation of the land.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Vegetable Gardening S-2. II. Fundamentals of Vegetable Growing.

A study of the general conditions influencing the growth of vegetables. The classroom and laboratory work aims to acquaint the student with the general problems of water requirements, nutritional requirements, and miscellaneous climatic factors and their effects on the growth and cultural methods employed in vegetable production. Special care will be taken to acquaint the student with the importance of detail, so that he will be able to make the most of the six months' training with some one of the leading vegetable growers in Massachusetts.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Vegetable Gardening S-3. I. Types and Varieties.

Success or failure in vegetable production depends upon the proper selection of types and varieties. Market demands differ in different sections, and there is a difference in the types produced from various seed sources. This department maintains a variety garden, growing some 250 or more varieties of vegetables, so as to train the student in the proper selection of types and varieties. Study is given to the source and desirability of good seed. The importance of high quality and good appearance of vegetables is kept before the student, so that he will be fitted to judge and exhibit vegetables.
2 class hours. 3 2-hour laboratory periods, credit, 5.

Vegetable Gardening S-4. II. Vegetable Forcing.

The demand is increasing for fresh vegetables out of season, and Massachusetts markets are among the best for such products. This course meets a real demand by giving the student training in the production of vegetables out of season. There is a demand for the men with this training. The student will study the latest and best methods of caring for greenhouse crops.
3 class hours. 2 2-hour laboratory periods, credit, 5.

Vegetable Gardening S-6. III. Vegetable Crops for the General Farm.

Many of the vegetable crops are of such a nature that they can be successfully grown as a side line to other types of farming. Special emphasis will be placed on those crops which the men interested in animal husbandry can use for a money crop or for stock-feeding purposes. The farm home garden is important for any farm, and here in this state the yield from such gardens is greater than in other states. As the area on the general farm devoted to vegetables is one of the most productive in money value, this course will show the student how to make the best use of this farm home garden.

3 class hours. 2 2-hour laboratory periods, credit, 5.

Vegetable Gardening S-7. III. Problems in Commercial Vegetable Gardening.

In order to understand the best methods of growing vegetables on a commercial scale, the student must be acquainted with the principles underlying these practices. Weekly assignments dealing with specific problems, as encountered in the actual business of growing vegetables commercially, are worked out by the students. Such problems as geographical factors affecting the industry, weather, market reports, the purchase of seeds, fertilizers and equipment, the study of various forms of machinery used by the market gardener, and the control of injurious insects and diseases are included in this course. Organized trips through the Connecticut Valley and one trip through the market gardening section near Boston are required. This latter trip requires about four days and costs each student approximately fifteen dollars.

1 2-hour class period. 4 1-hour laboratory periods, credit, 5.

Note. — Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

GENERAL COURSE FOR WOMEN.

A general course is offered for those young women who do not want to specialize in any one branch of agriculture, but who do want preparation for rural life. This course includes such agricultural and home economic courses as the country girl would be most likely to use, both for profit and for pleasure. The course should appeal to many young women whose home is on a farm or in a small town, or to those who hope some time to live in the country.

Agriculture S-1. I. Agricultural Opportunities for Women.

Agriculture is a field in which women are finding increasingly good opportunities. The particular problems which the women engaged in farming will have to meet, and the special lines of farming in which they will have favorable opportunities will be considered in a series of conferences.

2 class hours. Credit, 2.

Miss Hamlin.

Home Economics S-1. I. Clothing.

This course is based on the need of good judgment in the selection of clothing, both ready made and home made. It includes a study of fabrics, their cost, value, manufacture, and suitable use; of ready made and home made garments; and of design, color, and general appropriateness and becomingness of clothing. Some garments are made in the laboratory. One or more trips to textile mills and stores are included in the course. Estimated cost of materials used in the laboratory is five to ten dollars; estimated cost of trips is one and one-half dollars.

2 class hours. 2 3-hour laboratory periods, credit, 5.

Miss Tucker.

Home Economics S-2. II. Foods.

This course aims to teach wise food selection, and methods of preparation which are attractive, but which conserve food values. The use of a few basic principles in food preparation and serving, and in meeting nutritional needs will

be stressed. Special study will be made of the body needs of persons of different ages and activity, and of the choosing of foods to meet these needs.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Miss Knowlton.

Home Economics S-3. II. Health, and Home Nursing.

In this course emphasis is placed upon personal hygiene as a means of maintaining and improving health in the home. This will include ways of living to prevent sickness, the care of the family in case of unavoidable sickness, and the right attitudes toward health.
5 class hours. Credit, 5.
Miss Skinner.

Home Economics S-4. II. Home Management.

This course includes a study of the organizing and simplifying of methods of housekeeping; standards of living and family expenditures; the use of leisure time; family and community relationships.
5 class hours. Credit, 5.
Miss Skinner.

Home Economics S-5. III. Home Furnishing.

This course emphasizes the importance of attractive surroundings in creating a happy home life. It aims to develop good judgment and right standards in the selection of home furnishings. The discussions include the basic principles of good design, the use of color, the treatment of walls, floors, and windows, and the choice, cost, and arrangement of all types of furnishings found in the average home.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Miss Tucker.

RELATED SUBJECTS IN OTHER DEPARTMENTS.

Agricultural Economics S-1. II. Marketing.

The course deals with the importance and place of the agricultural industry in national development, and specifically with the types of profitable commercial agriculture in New England. It aims to co-ordinate the marketing practice with which the student has already become familiar during his placement training, or which he has used on his home farm, with the accepted principles and practices of farm marketing. The following are some of the topics discussed: marketing as a part of production; the principles of marketing; the methods of wholesale distribution; the methods of sale; the prices of farm products; government aids in marketing; co-operative buying and selling; the successful advertising of farm products; the principles of farm credit. Each student will be required to select some product of major interest to him and make a careful study of its production, handling, and marketing. The laboratory period is devoted to the graphic presentation of certain facts with regard to agricultural producing areas, to the prices obtained over a period of years and on different markets for specific products, to the writing of copy for agricultural advertisements, and to other similar problems. It also aims to familiarize the student with the methods of keeping graphic records or charts of income or other data which are reducible to a time series. During the term there will be a required two-day trip to the Boston market, for the purpose of studying at first hand the methods of handling products on the farmer's market, the use of the Produce Exchange, the cold storage system, the auction as a method of sale, the exporting of farm products, etc. The approximate cost of the trip is from ten to twelve dollars.
4 class hours. 1 2-hour laboratory period, credit, 5.
Department of Agricultural Economics.

Agricultural Engineering S-1. I. Farm Engineering.

This course is intended to familiarize the student with the various types of farm implements, to teach him their operation and care, and to give practice in the adjustment and repair of the mechanical equipment on the farm. The various types of field implements are studied, and emphasis is laid on the selection of implements suited to New England conditions. The adjustment of machines is discussed, and the student is given practice in setting machines for different field conditions.

Part of the course is given over to the repair of farm equipment. In this work the time is given to blacksmithing and to such exercises as soldering, babbitting and fitting bearings, lining up shafting, pipe fitting, threading bolts and nuts, and practice in tying knots and splicing rope. Farm implements are brought in and overhauled to give practical work in this line. In the limited time available it is not expected to make a blacksmith or mechanic out of the student, but it is hoped that the student will learn to know the tools used and get sufficient practice in their use so that he can make repairs on his own equipment.

Part of the course is given over to the study of water supply systems, including pumps, rams, and complete power systems. Farm-lighting plants are also studied, attention being given to selection, as well as care and operation. The principles underlying the practice of farm drainage are discussed, and practice is given in the use of simple leveling instruments for the purpose of accurately grading tile drainage ditches.

2 class hours. 3 2-hour laboratory periods, credit, 5.

DEPARTMENT OF AGRICULTURAL ENGINEERING.

Agricultural Engineering S-2. II. and III. Farm Motors.

This course deals with the gasoline engine as used for stationery work, automobiles, and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationery engines, automobiles, and tractors. Special attention is given to overhauling and repairing.

3 class hours. 2 2-hour laboratory periods, credit, 5.

DEPARTMENT OF AGRICULTURAL ENGINEERING.

Agricultural Engineering S-3. I. Carpentry.

This course gives practice in the care and use of carpenters' tools through bench work, repair of farm equipment, and building construction. Small buildings are erected by the students to give practice in all the phases of house construction. Practice is given in the building of forms, and in the mixing and placing of concrete. (Must be taken with Agricultural Engineering S-7.)

2 2-hour laboratory periods, credit, 2.

DEPARTMENT OF AGRICULTURAL ENGINEERING.

Agricultural Engineering S-4. II. Repair of Farm Equipment.

The object of this course is to give practice in the handling of tools, which will help in the repair of farm machines and miscellaneous farm equipment. Practice is given in forging, including drawing and shaping iron and steel, welding and tempering edged tools, and general blacksmith's repairing. Exercises also include pipe fitting, soldering, splicing rope, belt lacing, and babbitting and adjusting bearings. Practice is given in the use of machinists' tools, such as cold chisel, file, taps and dies, drill press, and lathe. (Must be taken with Agricultural Engineering S-7.)

2 2-hour laboratory periods, credit, 2.

DEPARTMENT OF AGRICULTURAL ENGINEERING.

Agricultural Engineering S-5. III. Dairy Mechanics.

This course is planned for men who are fitting themselves to take charge of dairy plants or allied lines of work. A study of steam boilers, steam engines, steam turbines, pumps, steam traps, line shafts, belting, electric motors, milking machines, and refrigeration plants.

3 class hours. 1 4-hour laboratory period, credit, 5.

DEPARTMENT OF AGRICULTURAL ENGINEERING.

Agricultural Engineering S-7. I and II. Farm Structures.

A study of the building materials commonly used in farm construction; details of construction and simple structural mechanics; the principle of design of such farm buildings as the dairy stable, hog house, horse barn, general purpose barn, poultry house, fruit and vegetable storage buildings, etc. In the drafting room practice will be given in the use of drawing instruments, and instruction in the fundamentals of drawing. Each student will have opportunity to design in complete detail one of the major farm buildings in which he is particularly interested. (Must be taken with Agricultural Engineering S-3 or S-4.)
1 class hour. 2 2-hour laboratory periods, credit, 3.
DEPARTMENT OF AGRICULTURAL ENGINEERING.

Agricultural Engineering S-8. I. Household Mechanics.

A study of house planning, heating, lighting, water supply, and sewage disposal. Practice will be given in the care and repair of household appliances.
2 class hours. 3 2-hour laboratory periods, credit, 5.
DEPARTMENT OF AGRICULTURAL ENGINEERING.

Agronomy S-1. I. Soils and Fertilizers.

All agricultural interests are vitally concerned with the soil and its adaptation and management for plant production. This course treats of the selection of suitable soils for the different purposes of agriculture, horticulture, and floriculture, and with the management of soils as regards moisture control, tillage, organic matter, soil bacteria, manure, lime, and fertilizer. The laboratory work gives training in the use and interpretation of the maps of the soil survey, in tests of soil texture, organic matter, and acidity, and in the identification of fertilizer materials. The composition and use of fertilizers will be studied and practice given in the calculation of fertilizer formulas. Practical field work will be given in judging the adaptation and value of soils, and field demonstration of the use of the tillage tools of the college farm. As a field project the student will be required to make a study of some farm, nursery, or florist's plant. This project includes a survey of the soil conditions and methods of soil and crop management, and recommendations based on a thorough analysis of the system from the soil up.
3 class hours. 2 3-hour laboratory periods, credit, 5.
DEPARTMENT OF AGRONOMY.

Agronomy S-2. III. Field Crops.

This course is planned to acquaint the student with the best and most successful practices of production and harvesting of field crops. Problems usually arising in connection with these practices will be studied. Special attention will be given to the hay crop, corn, potatoes, roots, and pastures. Field work with growing crops, and laboratory work in the identification of seeds of grasses, clovers, weeds, and small grains, in tests of purity and germination of seeds and in judging of different types of corn and potatoes will be given. Before completing the course the student will be expected to know how to select varieties, test seed, prepare the soil, select and apply fertilizer, plant, cultivate, harvest, and store the field crops important in Massachusetts.
2 class hours. 3 2-hour laboratory periods, credit, 5.
DEPARTMENT OF AGRONOMY.

Bacteriology S-1. II. Hygiene and Sanitation.

Deviation from health, from the normal being, is disease. The human body is susceptible to deviation from health. Certain elements are responsible for the entrance of disease into the body. The body becomes weakened through exposure, lack of exercise, unsuitable food, abuses. Under such circumstances it lays itself open to attack. There is the attack from within, which consists of some organic derangement, and the attack from without, which makes it possible for foreign enemies, agents, or micro-organisms to enter.

Closely associated with the production of disease are intermediaries and casual factors, as ventilation, water-supplies, sewage disposal, and food. They serve as vehicles for disease agents. The germs of disease find their way through them, and are carried by them. Besides, human contact seems to be the most important disseminator, and insects and animals may harbor or convey, and in some instances instigate, disease.

Then there are those conditions which react on the body in a physical manner and influence its mechanism and its operating facilities, as mental disturbances, character of food, conditions of living.

It is the purpose of this course to discuss the nature of diseases, what causes them, the significance of sanitation and hygiene in preventing them, and the methods of control; in other words, to study, in the light of present knowledge, how to preserve health and prevent deviation from health.

5 class hours. Credit, 5.

DEPARTMENT OF BACTERIOLOGY.

Bacteriology S-2. I. Dairy Bacteriology.

Bacteria and other micro-organisms are the responsible agents for the changes which occur in milk and for the contagion which sometimes causes diseases. They are found at times in milk when leaving the udder, they get in with the dust and dirt while milking, and they adhere to the dairy utensils, which carry them over from one milking to the next. From the cow to the consumer there is the constant presence of these micro-organisms to contend with, on the one hand, and to foster, on the other. All steps taken are significant in their control. The milking process, the handling of the cow, the condition of the milker, the cleansing of utensils, the management of the stable, feeding, straining, aeration, cooling, clarifying, pasteurizing — all are steps in the control of micro-organisms.

Many kinds of changes take place in milk, due to different kinds of micro-organisms. Many of these changes are sought, as the ripening of cream for butter, of milk for cheese, of milk for milk drinks; and many of these changes, also, are fought against, as ropy milk, sour milk, bitter milk, tainted milk, etc.

Micro-organisms of typhoid fever, scarlet fever, diphtheria, and others not infrequently find their way through the milk to the consumer, and produce epidemic forms of these diseases.

It is evident, therefore, that to handle milk and milk products safely it is desirable to know something of the agents which are the source of so much attention in the dairy. This indicates the nature of the substance of this course. This course is required of all students who elect dairying as one of their special lines of work.

5 2-hour laboratory periods, credit, 5.

DEPARTMENT OF BACTERIOLOGY.

Business Law S-1. II.

The course consists of a particular study of the contract, drawing, reading, and interpreting the same; the sale; and problem work. Other branches of the law such as deeds, mortgages, corporations, partnerships, commercial paper, torts, and personal rights are explained and presented by lectures during the course. Particular stress is placed on the reasoning process.

5 class hours. Credit, 5.

English S-1. I. Composition.

Required of first-year students with less than two full years of high school preparation or its equivalent; elective for others. The course consists of directed readings (one book or its equivalent per week); essay writing (one short essay, book report, personal or business letter, or writing of a similar nature per week); and an oral presentation (a five-minute address or talk on an assigned topic to be prepared for each week, and as many heard as time permits).

3 class hours. Credit, 3.

English S-3. III. Composition.

Required of second-year students interested in dramatic presentation; elective for others. This course is a continuation of Course S-1, but lays particular stress on the drama and dramatic presentation. (All dramatic presentation endeavored by the Two-Year Course, or other short courses to be under the direction of the instructor in English Composition.)
3 class hours. Credit, 3.

Entomology S-1. III. Beekeeping.

This course comprises a general consideration of the biology of the honey bee, and the elements of practical beekeeping. This includes the life history of the individuals and their relation to the colony, their structure, normal behavior, and instincts, and the relation of bees to horticulture and other forms of agriculture. The best methods of management, which will produce more productive colonies for pollination purposes and honey production, are studied. Consideration is given to the economic side of beekeeping, which also includes methods of marketing, disposal of by-products, and bee disease control. As far as possible, the work in constructing materials and apparatus and in the manipulation of bees is made individual.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Department of Entomology.

Farm Management S-1. II. Farm Management and Accounts.

A study of farming as a business; the correlation and adaptation of different farm enterprises, as dairy, orchard, poultry, to the specific farm; land, labor, and capital requirements; farm and building, plans and arrangements; the choice and purchase of a farm. Several laboratory periods will be devoted to practice in farm accounting. Farm experience and the keeping of a personal expense account during the period of placement training are prerequisites to this course.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Department of Farm Management.

Forestry S-1. II. Woodlot Management.

A course in tending, harvesting, marketing, and renewing the forest crop, with particular reference to the problems of the farm woodlot. The instruction is mainly practical, and is conducted in the field, with a minimum of bookwork; but there is a constant emphasis upon the development of keen and imaginative observation, and the acquisition of the conservationist point of view. Opportunities for field work are varied and extensive. There are woodlots of several types on or near the campus, and students have the fullest use of the Mt. Toby Demonstration Forest, a 750-acre tract seven miles distant, belonging to the college and managed by the Forestry Department.
2 class hours. 1 4-hour and 1 2-hour field period, credit, 5.
Department of Forestry.

Horticultural Manufactures S-1. I.

The utilization of culls and low grades of fruits and vegetables is becoming a more important problem each year. Producers should be able to market their whole crop at a profit. The general problems studied in this course will be: the manufacture of apple products from cull apples; the canning of all fruits and vegetables available at this season, together with the manufacture of their various products, such as jams, jellies, conserves, pickles, etc. Students will be required to keep accurate account of costs of materials in all canning and manufacturing operations, together with a record of methods used.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Department of Horticultural Manufactures.

Horticultural Manufactures S-2. II.

This is a continuation of Course S-1. The preservation of small fruits, together with the manufacture of their products; the evaporation of fruits and vegetables, and the manufacture of fruit syrups are the principal subjects studied.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Department of Horticultural Manufactures.
Prerequisite, Horticultural Manufactures S-1.

Horticultural Manufactures S-3. III.

This is a continuation of Courses S-1 and S-2. The manufacture of maple products and fermented pickles, and the canning of spring vegetables will be the principal subjects studied. Students will be given opportunity to make special studies along the lines of their greatest interest.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Department of Horticultural Manufactures.
Prerequisites, Horticultural Manufactures S-1 and S-2.

Rural Sociology S-1. I and II.

The first part of the course deals with a study of the individual and his relationships and conflicts in society. Particular note is taken of rural society and its problems. The remainder of the term is taken up with specific problem study, individual topics are assigned, and papers are prepared and read in class.
5 class hours. Credit, 5.

Veterinary Science S-1. III. Animal Diseases.

This course acquaints the student with the more common diseases to which domesticated animals are susceptible. Particular attention is given to conditions favoring diseases, to communicable diseases, and to prophylactic measures, in order that the student may be able to reduce the prevalence of disease among animals in his charge.
5 class hours. Credit, 5.
Department of Veterinary Science.

FARM PLACEMENT.

The work of placing students on farms is in charge of the supervisor of farm placement training. Farms are selected in the State that will enable a student to gain practical experience in his particular vocation. This farm experience may, by special arrangement, be secured on the home farm. As a rule, it will be found better for a student to spend this six months away from the home farm, even though he plans to be employed on the home farm after finishing the course. This statement is based on the experience of students who have already taken the course.

If credit is to be secured for the six months' placement training the following conditions must be carefully observed: (1) the student must interview the supervisor early in his first year in order that his qualifications, the type of farming he wishes to pursue, and his general fitness may be determined; (2) no arrangement for placement training may be made by the student himself until the supervisor has been consulted; (3) students are required to complete their period of training without unnecessary absences; (4) no transfers are to be made by a student if he is to receive credit, until permission has been had from the supervisor; (5) a position may not be given up by the student until the supervisor has been notified; (6) a monthly report must be furnished on the form supplied, and submitted not later than the fifth of each month during his training period; (7) a student whose grade of work is regularly poor (below a 70 rating) in the classes of his major subject will not be eligible for placement training, unless recommended by the department in charge of his major work; (8) when a student fails to complete the requirements of his placement training with a satisfactory grade, he is not allowed to take the work of the second year; (9) all male students are given a thorough physical examination by the Department of Physical Education at the beginning of the college term. Any disabilities liable to affect the student's placement work are noted, and, if of a serious nature, recommendations for corrective measures are supplied. Parents should understand that most kinds of agricultural work require a well-balanced combination of brawn and brain. No student whose physical condition is questionable will be accepted for placement training without a physician's certificate and parent's approval.

It should be clearly understood by both employer and employee that the same energy, regularity, and general conduct will be expected of the student during his period of placement training as is expected in his work in classes and on the campus.

It should also be noted that this six months' farm experience is educational in its nature. Students are expected to earn and receive a reasonable wage, but the purpose of the training is the experience gained rather than the wage earned. The scale of wages may vary in different localities, but each man's ability is given very careful thought, that he may obtain a wage that is fair to him. In the event of any misunderstanding the supervisor should be immediately informed.

PHYSICAL EDUCATION.

For Women.

[All women students are required to take physical education throughout the first year and may elect it with credit during the first and second terms of the last year. All women students, upon entering, must present a form report of a physical examination by their family physician.]

Physical Education S-1. I.

This course will include such outdoor sports as soccer, basketball, tennis, and hiking.

2 class hours. Credit, 2.

Mrs. Hicks.

Physical Education S-2. II.

This course will include posture exercises, folk dances, and games.

2 class hours. Credit, 2.

Mrs. Hicks.

Physical Education S-3. I. S-4. II.

Elective for second-year women.

2 class hours. Credit, 2.

Mrs. Hicks.

For Men.

[All male students are given a physical examination upon entering.]

Physical Education S-5. I.

Recreation. Required of first-year men. Outdoor games.

2 class hours. Credit, 2.

Mr. Ball.

Physical Education S-6. I. S-7. III.

Recreation. Required of second-year men. Outdoor games.

2 class hours. Credit, 2.

Mr. Ball.

Students reporting regularly in athletic squads for football, basketball, or baseball are not required to take the above courses.

SHORT COURSES AT THE MASSACHUSETTS AGRICULTURAL COLLEGE.

Short Courses are based on the idea that the motive which inspires study is the most significant factor in study itself, and that this motive rises when the student himself realizes he faces a problem that calls for a solution. Therefore, there is no age limit. Enrolled in short courses are found the young and the old, the experienced and the inexperienced, the theoretical and the practical. In this grouping there is a value, since students learn from each other as well as from the instructors. Practically all Short Course students intend to make a direct application of the knowledge given. Hence the aim of Short Course work is to offer the largest amount of information and training in agricultural and horticultural lines in the shortest possible time. During the past twenty years Short Courses have served hundreds of students in this Commonwealth, and the demand for these courses in recent years has steadily continued.

A ONE-YEAR VOCATIONAL COURSE IN POULTRY HUSBANDRY.

J. C. GRAHAM, LUTHER BANTA, W. C. SANCTUARY, MISS MARION PULLEY.

The One-Year Vocational Poultry Course is designed to meet the needs of those who wish to specialize in this branch of agriculture, but who can spend only one year at the college. The course is vocational in its nature, the plan of which is to "learn to do by doing."

In addition to Poultry Courses 1 and 2, students elect enough collateral work from Course 11 to make a total of 18 to 20 credit hours. From the close of the Winter School, about March 10, until college closes, the latter part of June, they devote all of their time to poultry work. During the summer vacation, students have an opportunity to secure additional practical experience on general or specialized farms. With the opening of college in the fall, students again devote all of their time to poultry work, finishing the course at the end of the fall term, the latter part of December. As the busy season with poultrymen begins soon after the first of the year, the students, by finishing the course before the holiday season, are ready to accept attractive positions or enter business for themselves.

The following schedule of courses indicates the nature of the work:

Course	1.	II.	Introductory.
Course	2.	II.	Poultry Breeding.
Course	3.	II.	Poultry Diseases.
Course	4.	III.	Poultry Feeding.
Course	5.	III.	Incubation and Brooding.
Course	6.	III.	Conferences.
Course	7.	III.	Plant Practice.
Course	8.	I.	Judging and Housing.
Course	9.	I.	Marketing.
Course	10.	I.	Problem Discussions.
Course	11.	II.	Supplementary courses in farm management, agricultural engineering, pomology, vegetable gardening, etc.

Entrance Requirements.

Applicants must be at least eighteen years of age and have a good elementary education.

Fees.

Effective in September, 1926, a tuition fee of $20 per term will be charged students, residents of Massachusetts, enrolled in the one-year course. The tuition fee for non-resident students is $60 per term. A laboratory fee of $5 is required for the fall term and the same for the spring term.

For further information, write or apply to Roland H. Verbeck, Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

THE WINTER SCHOOL.

The Winter School has been established for a number of years at the college, and has proved to be very popular with farmers, their wives, sons, and daughters, teachers, college graduates, and others. This school begins about the first of January. Instruction was offered last year in —

Soil Fertility
Field Crops
Types and Breeds of Live Stock
Live Stock Feeding
Animal Breeding
Farm Management
Farm Accounts
Farm Motors
Dairy Bacteriology
Animal Diseases
Poultry Diseases
Poultry Husbandry
Vegetable Gardening
Principles and Methods of Teaching
Special Methods in Vocational Agricultural Teaching
Agricultural Teaching Improvement Problems in Massachusetts
Tree Fruits
Pruning Tree Fruits
Spraying
Small Fruits
Harvesting and Marketing
Horticultural Manufactures
Floriculture
Marketing Farm Products
Botany
Entomology
Rural Sanitary Science and Hygiene
Agricultural Opportunities for Women
Food for the Family
Clothing for the Family
Home Management
Family Health
Dairying
Greenskeepers' Course

A series of special two-week courses in ice-cream making, butter making, milk testing, and market milk are offered. During the two weeks the student devotes all of his time to the work of the special course in which he has enrolled. The instruction lasts throughout the day from 8 to 5. These courses meet a very definite need in the State for those who wish instruction, but who cannot attend for a longer period of time, and who do not wish to take other subjects.

Fees.

For all students taking the full ten-weeks term of the Winter school there is a tuition fee of $10 and, in addition, a registration fee of $5. There are no laboratory fees in connection with any of the courses.

For further information, write or apply to Roland H. Verbeck, Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

DEGREES CONFERRED — 1927.

MASTER OF SCIENCE (M.S.).

Buchanan, Walter Gray, B.S., Massachusetts Agricultural College	Bernardston.
Hopkins, Elizabeth Frances, A.B., Vassar	Canandaigua, N. Y.
McDonnell, Anna Henneberry, A.B., Smith	Florence.
Sessions, Alwyn Conery, B.S., Utah Agricultural College	Logan, Utah.

MASTER OF LANDSCAPE ARCHITECTURE (M.L.A.).

Simmons, Kenneth Boyd, B.S., Clemson College	Rowesville, S. C.

BACHELOR OF SCIENCE (B.S.).

Ames, Robert Call	Falmouth.
Amstein, William Gerald	South Deerfield.
Baker, Philip Woodell	Amherst.
Barnes, Russell Norris	Wallingford, Conn.
Biron, Raphael Alfred	Amesbury.
Black, Lewis Herbert	Williamsburg.
Boden, Frank Joseph	North Wilbraham.
Bovarnick, Max	Dorchester.
Briggs, Lawrence Elliott	Rockland.
Bruce, Frances Clara	Easthampton.
Bruorton, Earle Wallace	Reading.
Buckler, Ella Maud	Pittsfield.
Buckley, Arthur Vincent	Natick.
Burrell, Robert Wallace	Abington.
Campbell, Donald Hays	Shirley.
Carlson, Oscar Ernest	Boston.
Chamberlain, Alexander Rodger	Springfield.
Clagg, Charles Floyd	Barnstable.
Cobb, Roger Madison	Wrentham.
Connell, Edward Anthony	Malden.
Cook, Wendell Burnham	Townsend.
Crooks, Clarence Arthur	North Brookfield.
Cummings, Maurice Andrew	Cambridge.
Cutler, Samuel	Springfield.
Davison, Ruth Eugenia	West Springfield.
Dole, William Levi	Medford.
Farwell, Theodore Austin	Turners Falls.
Foley, Richard Carol	Portland, Me.
Galanie, Demetrius Lincoln	Natick.
Goldberg, Louis Noah	Wilmington.
Goller, Hilda Margaret	Holyoke.
Greenaway, James Emerson	Springfield.
Greenwood, Elliott Kelton	Hubbardston.
Griffin, Raymond George	Southwick.
Haertl, Edwin Jacob	West Roxbury.
Hanson, Daniel Cameron	Dracut.
Harris, Herbert Joseph	Springfield.
Hart, Ralph Norwood	Dorchester.
Haskins, Ralph Warner	Greenfield.
Hatch, George Franklin, Jr.	West Roxbury.
Henneberry, Thomas Vincent	Manchester.
Ingraham, Mary	Millis.
Kane, Thomas Joseph	Westfield.
Krassovsky, Leonid Alexander	Russia.
Kuzmeski, John William	Leverett.
LeNoir, Thomas Benjamin	Greenwood.
Mahoney, John Joseph	Westfield.
Maxwell, Lewis Joseph	Stoneham.
McAllister, Robert Wright	North Billerica.
McVey, Ernest Gregory	North Easton.
Merlini, Angelo Albert	North Adams.
Milligan, Kenneth William	State Line.
Nash, Norman Blake	Abington.
Nottebaert, Harry Charles	Lexington.
Parkin, William Hildreth	Chicopee.
Parsons, Clarence Howard	Amherst.
Parsons, Josiah Waite, Jr.	Northampton.
Partenheimer, Merrill Henry	Greenfield.
Peirce, Veasey	East Weymouth.

Pickens, Herman Eames	Stoneham.
Putnam, Ernest Taylor	Greenfield.
Pyle, Everett John	Plymouth.
Reed, James Burbank	Waltham.
Rhoades, Lawrence Duncan	New Marlborough.
Richter, Otto Hermann	Holyoke.
Rivnay, Ezekiel	Holyoke.
Robinson, Clifton Fairbanks	Newtonville.
Robinson, Neil Cooley	Arlington Heights.
Savage, Donald Clifford	South Orange, N. J.
Sharp, Dallas Lore, Jr.	Hingham.
Sherman, Willis Whitney	Boston.
Snyder, Allan	Holyoke.
Spelman, Albert Francis	New London, Conn.
Swan, Frederick Walter	Milton.
Verity, Herbert Foster	Woburn.
Walker, Almeda Marion	Southbridge.
Whitaker, Lewis Harlow	Hadley.
White, John Everett	Abington.
Wiggin, Jennie May	Worcester.
Williams, Earl Fletcher	Whitinsville.

BACHELOR OF VOCATIONAL AGRICULTURE (B.VOC.AGRI.).

Cartwright, Calton Oliver	Northampton.

REGISTRATION, 1927–28.

GRADUATE STUDENTS.

Registered since Issue of the Catalogue for 1926–27, to October 1, 1927.

Allen, Thomas A.B., Colgate University.	Belchertown.
Arrington. Luther B. B.S., Massachusetts Agricultural College.	Florence.
Barber, Elmer E. B.S., Massachusetts Agricultural College.	Jamaica Plain.
Bauer, John J. Ph.B., Brown University.	New Bedford.
Boden, Frank J. H. B.S.. Massachusetts Agricultural College.	North Wilbraham.
Bourgeois, Florence A.B., Smith College.	Williamsburg.
Bower, James, Jr. B.S., Massachusetts Agricultural College.	Holyoke.
Brewster. Sam F. B.S., Texas Agricultural and Mechanical College.	Belton, Tex.
Brockway, Alice M. B.A., Mt. Holyoke College.	South Hadley.
Buchanan, Walter G. B.S., Massachusetts Agricultural College.	Bernardston.
Carley, Mrs. Abby P. B.S., Connecticut College.	Stonington, Conn.
Carlson, Oscar E. B.S., Massachusetts Agricultural College.	Amherst.
Cartwright, Calton O. B.Voc.Agri., Massachusetts Agricultural College.	Northampton.
Chesley, George L. B. Humanics, Springfield Y. M. C. A. College.	Concord, N. H.
Clagg, Charles F. B.S., Massachusetts Agricultural College.	Barnstable.
Clary, Snowden R. B.S., Iowa State College.	Sigourney, Iowa.
Couhig, Philip H. B.S., Massachusetts Agricultural College.	Beverly.
Cowing, William A. A.B., Colby College.	West Springfield.
Davis, Josephine E. A.B., Smith College.	Holden.
Dowd. William L. B.S., Massachusetts Agricultural College.	North Amherst.
Drain, Brooks D. B.S., Ohio State University. M.S., University of Chicago.	Amherst.
Dufresne, Virginia Roberta A.B., Mt. Holyoke College.	Springfield.
Dull, Malcolm A.B., Hope College.	Muskegon, Mich.
Dye, Arthur P. B.S.A., M.S., West Virginia University.	Morgantown, W. Va.
Emery, Herbert M. B.S., Massachusetts Agricultural College.	Newburyport.
Evans, Mildred W. A.B., A.M., Radcliffe College.	North Cambridge.
Farrar, Clayton L. B.S., Kansas State Agricultural College.	Amherst.
Fessenden, Richard W. B.S., Massachusetts Agricultural College.	Middleborough.
France, Ralph L. B.S., University of Delaware.	Wilmington, Del.
Frye, Florence M. B.S., Boston University.	South Hadley Falls.
Fuller, James E. A.B., A.M., Colorado College.	Amherst.
Garvey, Mary E. M. B.S., Massachusetts Agricultural College.	Amherst.
Gates, Clifford O. B.S.A., Purdue University.	Kokoma, Ind.
Gilbert, Chauncey McL. B.S., Massachusetts Agricultural College.	Amherst.

Goodwin, William I.	B.S., Massachusetts Agricultural College.	North Amherst.
Griffiths, Francis P.	B.S., University of Washington.	Seattle, Wash.
Hallowell, Elizabeth	A.B., A.M., Boston University.	Wollaston.
Hamilton, W. Brooks	B.S.A., Macdonald College of McGill University.	St. Lambert, Que., Can.
Hanscomb, Mrs. Mary B.	B.S., Massachusetts Agricultural College.	Ortega, Fla.
Hanscomb, George W.	B.S., Massachusetts Agricultural College.	Ortega, Fla.
Harris, Hugh K.	B.S., Texas Agricultural and Mechanical College.	Temple, Tex.
Hawley, Henry C.	A.B., Oberlin College. M.B.A., Harvard Graduate School of Business Administration.	Amherst.
Hays, Frank A.	B.S., Oklahoma Agricultural and Mechanical College. M.A., University of Nebraska. Ph.D., Iowa State College.	Amherst.
Heald, Jay M.	B.S., Massachusetts Agricultural College.	Lincoln.
Hopkins, Elizabeth F.	A.B., Vassar College.	Canandaigua, N. Y.
Horne, Robert S.	B.S., Massachusetts Agricultural College.	Amherst.
Johnson, Edward D.	B.S., University of Maine.	Faneuil.
Johnson, Loyal R.	B.S., Colorado Agricultural College.	Monte Vista, Col.
Jones, Mrs. Mildred W.	A.B., Smith College. M.A., University of Illinois.	Amherst.
Kakavas, James C.	B.S., Massachusetts Agricultural College.	Amherst.
Kelly, Oliver W.	B.S., Colorado Agricultural College.	Fort Collins, Col.
Kenney, Irene E.	A.B., Mt. Holyoke College.	Amherst.
King, Cordelia B.	A.B., Smith College.	Pineville, La.
Knudsen, Harold R.	B.S., Brigham Young University.	Provo, Utah.
Landry, Herbert A.	B.M.E., School of Engineering, Northeastern University.	West Springfield.
Lanphear, Marshall O.	B.S., M.S., Massachusetts Agricultural College.	Amherst.
Larsinos, George J.	B.S., Massachusetts Agricultural College.	Westfield.
MacMasters, Majel M.	B.S., Massachusetts Agricultural College.	Collinsville, Conn.
Mayo, William I., Jr.	B.S., Massachusetts Agricultural College.	Northampton.
Miroyiannis, Stanley D.	B.S., Eastern Nazarene College.	Boston.
McCormick, Eileen M.	A.B., Mt. Holyoke College.	Holyoke.
McDonnell, Anna H.	A.B., Smith College.	Florence.
Merritt, Lucius A.	B.S., Trinity College.	Williamsburg.
Moody, Robert E.	B.S., Rutgers College.	Minotola, N. J.
Moran, John	B.S., Massachusetts Agricultural College.	Amherst.
Moriarty, Helen E.	A.B., Smith College.	Holyoke.
Muller, Richard T.	B.S., Cornell University. M.S., University of Maine.	Amherst.
O'Brien, Mary C.	B.S., Educ., Normal Art School.	Greenfield.
O'Connor, Mary M.	A.B., Smith College.	Northampton.
O'Shea, Agnes V.	A.B., Smith College.	Northampton.
Patch, Lawrence H.	B.S., Massachusetts Agricultural College.	Wenham.
Pettee, Donald A.	B.S., University of New Hampshire.	Francestown, N. H.
Prescott, Glenn C.	B.A., University of Maine.	Florence.
Pulley, Marion G.	B.S., Massachusetts Agricultural College.	Amherst.
Putnam, Ernest T.	B.S., Massachusetts Agricultural College.	Greenfield.
Rae, Florence J.	B.A., Mt. Holyoke College.	Holyoke.

Reid, Allen H. B.S., Oregon Agricultural College.	Portland, Ore.
Rivnay, Ezekiel B.S., Massachusetts Agricultural College.	Amherst.
Roberts, Oliver C. B.S., Massachusetts Agricultural College.	Amherst.
Robertson, William F. B.S., Massachusetts Agricultural College.	Framingham.
Salman, Kenneth A. B.S., Massachusetts Agricultural College.	Needham.
Sanctuary, William C. B.S., Massachusetts Agricultural College.	Amherst.
Sazama, Robert F. B.S., Massachusetts Agricultural College.	Northampton.
Scheffer, William J. Dipl.Agric., Royal Hungarian Agri. Academy of Magyarovar. Dipl.Agric., State College of Agriculture, Berlin.	Magyarovar, Hungary.
Scott, Lorena C. A.B., Bates College.	North Hadley.
Sessions, Alwyn C. B.S., Utah Agricultural College.	Logan, Utah.
Seymour, Frank C. A.B., Harvard University. B.D., Union Theological Seminary.	North Amherst.
Shea, Mary M. A.B., Smith College.	Holyoke.
Simmons, Kenneth B. B.S., Clemson College.	Rowesville, S. C.
Small, Alan F. A.B., Bowdoin College.	Worcester.
Smiley, Ray G. B.S., Massachusetts Agricultural College.	Worcester.
Smith, Elinor VanD. A.B., Brown University.	Hadley.
Smith, Marcus S. A.B., Colgate University.	Morristown, N. J.
Spooner, Raymond H. B.S., Massachusetts Agricultural College.	Brimfield.
Springs, James D. B.A., Clark University.	Merchantville, N. J.
Swanback, T. Robert Agronom., Agricultural College of Ultuna, Sweden.	Windsor, Conn.
Sylvester, Arthur C. B.S., University of Maine.	Merrimac.
Thompson, Harold G. B.S., Yale University.	New Haven, Conn.
Towne, Carroll A. B.S., Massachusetts Agricultural College.	Amherst.
Turner, Charles E. B.S., Massachusetts Agricultural College.	Springfield.
Van Meter, Ralph A. B.S., Ohio State University.	Amherst.
Wason, George F. A.B., Harvard University.	Hingham.
Webber, Clarice V. A.B., Smith College.	Springfield.
Weeks, Mildred I. A.B., Radcliffe College.	South Gardner.
Wilder, Frank H. B.S., Massachusetts Agricultural College.	Sterling Junction.
Wildon, Carrick E. B.S., Massachusetts Agricultural College.	Melrose Highlands.
Wilkins, Roland L. B.S., University of Maine.	North Jay, Me.
Williams, James L. B.S., Massachusetts Agricultural College.	Sunderland.
Witt, Earl M. B.S., Massachusetts Agricultural College.	Belchertown.
Wolfe, Benjamin F. B.S.A., Purdue University.	Norman, Okla.
Wright, Ellen S. A.B., Mt. Holyoke College.	Deerfield.

ENROLLMENT.

Men, 83; women, 28; total, 111.

CLASS OF 1928.

Abrahamson, Howard Joseph	Waltham	Lambda Chi Alpha.
Albertini, Paul Flanders	Billerica	Kappa Epsilon.
Allen, Leo Linwood Fenton[1]	Athol	North College.
Amatt, Jack	Northampton	Kappa Sigma.
Ansell, Harold King	Amherst	Kappa Sigma.
Avery, Blanche Deane	Greenfield	Abigail Adams House.
Barnard, Ellsworth	Shelburne Falls	Q. T. V.
Bartlett, Kenneth Alden	Dorchester	Aggie Inn.

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[1] Candidate for degree of bachelor of vocational agriculture.

Batchelder, Lora Margaret	Easthampton	Abigail Adams House.
Baumgartner, Hans	Pittsfield	11 South College.
Bearse, Gordon Everett	Sharon	Alpha Gamma Rho.
Beeman, Marjorie Elise	Ware	Care of Dr. Chamberlain, Mt. Pleasant.
Botulinski, Frank John	Boston	West Experiment Station.
Bradford, David Carlton	Springfield	Alpha Gamma Rho.
Bray, Frederick Roland	Amherst	5 East Pleasant Street.
Bray, Walter Abner	Amherst	5 East Pleasant Street.
Brockway, Horace Taylor, Jr.	South Hadley	Q. T. V.
Chapman, Dorothy Ann	Newtonville	Abigail Adams House.
Church, Cornelia Bassett	North Amherst	North Amherst.
Clark, Harold Eugene	Montague	Sigma Phi Epsilon.
Cook, Albert Cairnes	Waverley	13 North College.
Cooke, Dorothy Mabel	Richmond	Abigail Adams House.
Crowley, Francis Jeremiah	Amherst	20 Woodside Avenue.
Cunningham, James Hugh	Quincy	Alpha Sigma Phi.
Davis, Richard Jackson	Arlington	Phi Sigma Kappa.
Dean, Carolyn	Utica, N. Y.	Abigail Adams House.
Denton, Ian Oliphant	Boston	27 Fearing Street.
Draper, William Hill, Jr.	Watertown	Kappa Sigma.
Dresser, Horatio Malcolm	South Hadley	Alpha Sigma Phi.
Elliott, Lawrence William	Waltham	Lambda Chi Alpha.
Estes, Wendall Eames	West Duxbury	Phi Sigma Kappa.
Evans, Joseph Andrew	Lawrence	6 North College.
Ewer, Seth Judson	Leyden	13 Phillips Street.
Ferguson, Thomas Wells, Jr.	Newtonville	Theta Chi.
Flemings, Frederic James	Sharon	Theta Chi.
Forest, Joseph Henry	Arlington	Alpha Gamma Rho.
Fox, Robert Leo	Ware	Q. T. V.
Frese, Paul Frederick	Waltham	French Hall.
Gifford, Charles Edwin	Sutton	Kappa Sigma.
Goldberg, Maxwell Henry	Stoneham	13 South College.
Hall, Harriet Phoebe	Great Barrington	Abigail Adams House.
Hall, John Stanley	Lynn	Alpha Gamma Rho.
Hilyard, Joseph Raymond	Beverly	120 Pleasant Street.
Hodson, Alexander Carlton	Reading	Sigma Phi Epsilon.
Holland, Bertram Holbrook	Millis	Q. T. V.
Homeyer, Frank Fuller	Wellesley Hills	Theta Chi.
Howland, Walter Morton	Conway	Alpha Gamma Rho.
Hyde, William Eaton	Amherst	55 Pleasant Street.
Karrer, Robert Joseph	Hingham	Phi Sigma Kappa.
Kennedy, Wellington Waterloo	Red Bank, N. J.	30 Fearing Street.
Kidder, Dana Judson, Jr.	Fayville	11 South College.
Kimball, John Adams	Littleton	Lambda Chi Alpha.
Ladas, Constantine Pericles	Boston	11 North College.
Lane, Donald Ricker	Brockton	7 North College.
LaPrise, Albert Joseph	Great Barrington	Lambda Chi Alpha.
Laubenstein, Karl George	Maynard	3 North College.
Lawrence, Julia Ruth	Springfield	Abigail Adams House.
Leonard, Charles Smith	Chicopee	Lambda Chi Alpha.
Leonard, Dorothy Luella	West Springfield	Abigail Adams House.
Lincoln, Margaret Elizabeth	Shirley	116 Pleasant Street.
Lincoln, Robert Alexander	Hingham Center	Theta Chi.
Little, Margaret Adams	Newburyport	Abigail Adams House.
Loring, Douglas Winthrop	Springfield	Phi Sigma Kappa.
Love, Elizabeth Perry	Auburn	Abigail Adams House.
Lynsky, Myer	Dorchester	14 South College.
Marsh, Edwin Elliott	Pittsfield	Q. T. V.
Marston, Leon Chester, Jr.	Brockton	27 Fearing Street.
Marx, Walter Herman	Holyoke	Kappa Epsilon.
McEwen, Leslie Irving	Winchester	Lambda Chi Alpha.
McGuire, Walter Kenneth	Whitinsville	3 North College.
Moore, Ethan Dana	West Springfield	Alpha Gamma Rho.
Morey, Elizabeth Alma	Wollaston	Abigail Adams House.
Moriarty, Robert Earl	Monson	Alpha Gamma Rho.
Mulhern, Daniel Joseph	Roslindale	4 North College.
Murch, Ralph Gordon	Holliston	3 North College.
Noble, Frank Freeman	Fall River	Q. T. V.
Nutting, John Lyman	West Berlin	Phi Sigma Kappa.
Owers, Robert Hammond	Taunton	Alpha Gamma Rho.
Panzica, Josephine	Arlington	Abigail Adams House.
Pickett, Thomas Austin	Beverly	Davenport Inn.
Plantinga, Oliver Samuel	Amherst	North East Street.
Plantinga, Sarah Theodora	Amherst	North East Street.
Pratt, Marjorie Johnson	Dalton	Abigail Adams House.
Preston, Charles Putnam	Hathorne	Kappa Sigma.
Preston, Stanley Nichols	Hathorne	Kappa Sigma.
Proctor, Harriet Ellise	South Weymouth	Abigail Adams House.
Quinn, John Francis	New Bedford	3 North College.
Redgrave, Arnold Ide	Hopedale	Phi Sigma Kappa.
Reed, Roland Ellsworth	Greenfield	Lambda Chi Alpha.
Rice, Cecil Curtis	Worcester	10 North College.
Ricker, Albion Barker	Turner, Maine	Lambda Chi Alpha.
Roper, Hartwell Eveleth	Closter, N. J.	Alpha Gamma Rho.
Russell, Charles Edwin	West Brookfield	30 Fearing Street.
Ryan, Edward Parker	Swampscott	10 Nutting Avenue.
Schappelle, Newell Allen	Amherst	Alpha Gamma Rho.
Schmidt, Ernest John	Longmeadow	Phi Sigma Kappa.

Smith, Charles James, Jr.	North Wilmington	Sigma Phi Epsilon.
Smith, Leslie Rockwell, Jr.	Hadley	Kappa Sigma.
Smith, Walter Russell	Holden	Alpha Gamma Rho.
Southgate, Barbara Willson	Marshfield	Abigail Adams House.
Spencer, Ernest Leavitt	Lowell	Sigma Phi Epsilon.
Stratton, Frank	Boston	Alpha Gamma Rho.
Sullivan, Charles Burke	Fall River	16 South College.
Thomas, Howard	Holyoke	Phi Sigma Kappa.
Thompson, Frances Clarinda	Amherst	Mt. Pleasant.
Thompson, Leonard Lewis	Greenfield	15 North College.
Trull, Henry Bailey	Lowell	Sigma Phi Epsilon.
Tufts, Warren John	Jamaica Plain	Kappa Sigma.
Tulloch, George Sherlock	Bridgewater	Q. T. V.
Tuttle, Alden Parker	South Medford	Baker Place.
Van Hall, Walter Bernhardt	Roslindale	16 North College.
Voetsch, George Bernard	Greenfield	Sigma Phi Epsilon.
White, Edwin Searles	Worcester	12 North College.
Wilder, Edwin Arthur	Sterling Junction	Phi Sigma Kappa.
Williams, Florence Dorothea	East Norton	Abigail Adams House.
Worssam, Horace Herbert	Bernardston	Q. T. V.

Class of 1929.

Adams, Harold Sweetnam	Whitinsville	Alpha Gamma Rho.
Adams, Stephen[1]	Easthampton	M. A. C. Bungalow.
Alberti, Francis Daniels	Greenfield	22 Fearing Street.
Arnurius, Armond Lovell	East Orange, N. J.	50 Sunset Avenue.
Bailey, Stanley Fuller	Middleborough	Alpha Gamma Rho.
Barr, Charles Wesley	Pittsburgh, Pa.	Lambda Chi Alpha.
Bartlett, Irene Lawrence	Rowley	Abigail Adams House.
Bates, Ira Spaulding	Whitinsville	Alpha Gamma Rho.
Bertenshaw, Edith Louise	Fall River	Abigail Adams House.
Black, Chesley Leman	Reading	Sigma Phi Epsilon.
Blaisdell, Matthew Louis	North Amherst	Care of Mrs. Cooley, North Amherst.
Blomquist, Gustave Stanley	Quincy	Lambda Chi Alpha.
Bond, James Eaton, Jr.	South Lancaster	Alpha Gamma Rho.
Bowie, Robert Lester	East Milton	6 North College.
Brackley, Floyd Earle	Strong, Me.	Alpha Sigma Phi.
Burgess, Emory Dwight	Melrose Highlands	Phi Sigma Kappa.
Caldwell, Eleanor	Amherst	Care of Prof. F. A. Waugh.
Canney, George Gridley	South Hadley	Alpha Sigma Phi.
Carruth, Laurence Adams	Worcester	Apiary.
Chadwick, John Shore	Worcester	Lambda Chi Alpha.
Chapin, Alice Streeter	Sheffield	Abigail Adams House.
Cleaves, Charles Shepley	Gardner	Phi Sigma Kappa.
Clements, Charles Robert Crofford	Melrose	Phi Sigma Kappa.
Copson, Harry Rollason	Easthampton	Q. T. V.
Coukos, Andrew[1]	Lynn	2 North College.
Crowley, Dennis Michael	Boston	2 North College.
Davis, Donald Austin	Bedford	21 Fearing Street.
Day, William Albert Palmer	Watertown	9 North College.
Devine, John Warren	Arlington	Alpha Gamma Rho.
Dutton, George Wallace	Carlisle	Alpha Gamma Rho.
Dyer, Arnold Walton	Falmouth	Theta Chi.
Edson, William Gordon[1]	East Braintree	9 North College.
Egan, William Ambrose, Jr.	Springfield	Sigma Phi Epsilon.
Faulk, Ruth Adelaide	Brockton	Abigail Adams House.
Flint, George Bemis	Lincoln	Q. T. V.
Fonseca, Martin Goodman	Brighton	M. A. C. Farmhouse.
Fontaine, Mildred	Fall River	Abigail Adams House.
Frost, Charles Austin	Belmont	Phi Sigma Kappa.
Graves, Arthur Hall[1]	Ashfield	Q. T. V.
Hammond, Marjorie Allerton	Onset	Abigail Adams House.
Harrington, Mary Eileen	Holyoke	Abigail Adams House.
Harvey, Herman Chapin	Amherst	9 Spring Street.
Hawley, Guila Grey	Westfield	Abigail Adams House.
Hintze, Roger Thomas	Amherst	Aggie Inn.
Horan, Timothy Joseph	Whitinsville	4 North College.
Howe, Frank Irving, Jr.	Norfolk	Theta Chi.
Hunter, Walter Gordon	South Sudbury	Stockbridge Hall.
Huss, Miriam Hall	Newton Centre	Abigail Adams House.
Isham, Paul Dwight	Hampden	Q. T. V.
Johnson, Alice Luvanne	Holden	Abigail Adams House.
Johnson, Clifton Russell	Worcester	Alpha Gamma Rho.
Jones, Leroy Osgood	Greenfield	Lambda Chi Alpha.
Kane, Mary Catherine	Holyoke	Abigail Adams House.
Kay, John Reid	Roslindale	Kappa Sigma.
Kelley, Charles Edward	Dalton	Phi Sigma Kappa.
Kelton, Richard Coolidge	Hubbardston	10 North College.
Kinney, Asa Foster	South Hadley	Kappa Sigma.
Kreienbaum, Roman Albert	Bridgewater	Q. T. V.
Lyman, Warren Hillsgrove[1]	Florence	21 Fearing Street.
Lynch, Elizabeth Anne	Easthampton	Abigail Adams House.
Marsh, Kendall Howe	Holden	Alpha Gamma Rho.
McKay, Catherine Mary	Newtonville	Abigail Adams House.
McKittrick, Kenneth Fraser	Boston	Kappa Sigma.
Mills, Taylor Mark	Boston	Kappa Sigma.

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[1] Candidate for degree of bachelor of vocational agriculture.

Morrison, Leonard William	Monson	1 North College.
Nash, Robley Wilson	Abington	Kappa Sigma.
Nichols, Edward Holyoke	Montpelier, Vt.	Kappa Sigma.
Nitkiewicz, Boleslaw	Holyoke	Kappa Epsilon.
O'Leary, William Joseph	Northampton	15 Fearing Street.
Packard, Faith Evelyn	Windsor	Abigail Adams House.
Parrish, Ruth Harriet	Great Barrington	Abigail Adams House.
Patterson, Jane	Amherst	26 Lincoln Avenue.
Pease, Holton Stebbins	Hampden	Stockbridge Hall.
Perkins, Esther Janet	Easthampton	Abigail Adams House.
Perry, Kenneth William	Holliston	Sigma Phi Epsilon.
Plumer, Paul Raymond	Adams	Theta Chi.
Prouty, Earle Clinton	Mittineague	West Experiment Station.
Purseglove, Alfred Thomas	Northampton	49 Columbus Avenue, Northampton.
Rees, Robert Drake	Worcester	35 East Pleasant Street.
Richardson, Evan Carleton	Millis	Phi Sigma Kappa.
Robertson, William Brunner	Port Chester, N. Y.	Phi Sigma Kappa.
Rudquist, Birger John	Boston	Phi Sigma Kappa.
Rutan, Huntington	North Hadley	Theta Chi.
Sargent, Carmeta Elizabeth	Shrewsbury	Abigail Adams House.
Sargent, Leonard Fessenden Everett	Greenfield	12 South College.
Shuman, Ernest Clark	Malden	10 Nutting Avenue.
Sivert, Gladys Elizabeth [1]	Worcester	Abigail Adams House.
Slack, Grace Gertrude	Allston	Abigail Adams House.
Smith, Bessie May	West Somerville	Abigail Adams House.
Snell, Robert Sinclair	Southbridge	East Experiment Station.
Southwick, Walter Edward	Clinton	Kappa Epsilon.
Steere, Phillips Bradley	Chepachet, R. I.	Phi Sigma Kappa.
Steinbugler, Elizabeth Ann	Brooklyn, N. Y.	Abigail Adams House.
Sullivan, John Ayer	Medford	16 South College.
Tarr, Roy Simpson	Gloucester	Theta Chi.
Thayer, Frederick Daniels, Jr.	Shrewsbury	Kappa Sigma.
Tompkins, Earle Alexander	Easthampton	Alpha Sigma Phi.
Tourtellot, Roger Sampson	Providence, R. I.	Sigma Phi Epsilon.
Trevett, Moody Francis	Milford	22 Fearing Street.
Vartanian, Dickran	Springfield	11 North College.
Walkden, Charles Edward	Swansea	Q. T. V.
Webber, Dana Otis	Montague	North Amherst, Box 81.
Whitten, Russell Rutherford	Melrose	Lambda Chi Alpha.
Whittle, Doris Evelyn	Worcester	Abigail Adams House.
Williams, Lloyd George	Pittsfield	Kappa Epsilon.
Winton, Alexander Charles	Springfield	Kappa Epsilon.
Woodbury, John Sargent	Fitchburg	Alpha Sigma Phi.
Young, Prescott Davenport	North Grafton	Lambda Chi Alpha.
Zielinski, John Blaise, Jr.	Holyoke	16 North College.

Class of 1930.

Allen, Herbert Adams	Fitchburg	13 North College.
Allen, Raymond Clayton	Barre	3 Nutting Avenue.
Andrew, John Albion, Jr.	West Boxford	10 Nutting Avenue.
Armstrong, Robert Lindsey	East Sandwich	Sigma Phi Epsilon.
Atwood, Rachel	Greenfield	Abigail Adams House.
Babson, Osman	Gloucester	9 Mt. Pleasant.
Barrus, George Alvan [2]	Lithia	Clark Hall.
Bedford, Harry	Whitinsville	Alpha Gamma Rho.
Benoit, Edward George	Chicopee Falls	13 North College.
Bergan, Carl Augustus	Northampton	Kappa Sigma.
Berggren, Stina Matilda	Worcester	Abigail Adams House.
Bernard, Sergius Joseph	North Adams	10 South College.
Billings, Samuel Clark	Belmont	86 Pleasant Street.
Bishop, Frank Millard	Natick	Alpha Sigma Phi.
Bond, Richard Henry, Jr.	Needham	101 Pleasant Street.
Bottomly, Bruce Ely	Worcester	12 North College.
Brown, Mildred Shepard	North Amherst	North Amherst.
Buckler, May Frances	Pittsfield	Abigail Adams House.
Burbank, Oscar Frank, Jr.	Worcester	10 South College.
Burns, Theodore Chandler	Taunton	Sigma Phi Epsilon.
Call, Reuben Hillman	Colrain	16 South College.
Campbell, Harold Vining	Leyden	15 Phillips Street.
Chenoweth, Winifred Lee	North Amherst	North Amherst.
Cleveland, Maurice Mortimer	East Pepperell	16 South College.
Cook, Charles Hardy	Beverly	Theta Chi.
Cotter, Monica Quill	Somerville	Abigail Adams House.
Coven, Milton Isadore	Springfield	14 South College.
Cox, Charles Bartlett	Jamaica Plain	Kappa Sigma.
Daniels, Arthur Richards [2]	Dedham	Q. T. V.
Davis, Gertrude Jordan	Auburndale	Abigail Adams House.
Dean, Lucien Wesley	Millis	Q. T. V.
Decker, Charlotte Marthe	Holyoke	25 Fearing Street.
Denny, Myrtle Althea	Northampton	54 Pleasant Street.
Denton, Edward Wemyss	Norton	26 Fearing Street.
Donovan, Margaret Pauline	Bondsville	Abigail Adams House.
Dover, Evelyn	Methuen	Abigail Adams House.
Drew, William Brooks	Greenwich, Conn.	83 Pleasant Street.
Ellert, Fred Charles	Holyoke	10 South College.

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[1] Candidate for degree of bachelor of vocational agriculture.
[2] Admitted on probation; entrance record incomplete.

Elliot, Davis Haskins	South Westport	Sigma Phi Epsilon.
Frame, Charles Frederick	Rockland	8 North College.
Gagliarducci, Anthony Lewis	Springfield	Kappa Epsilon.
Gaumond, Alice Delimen	Southbridge	Abigail Adams House.
Goodell, Herbert Andrew	Southbridge	Sunset Avenue.
Goodell, Hermon Ulysses	Southbridge	Sunset Avenue.
Goodnow, Robert Gibson	Mendon	3 Fearing Street.
Grant, William Edward [2]	Boston	Colonial Inn.
Griswold, Wesley Southmayd	Meriden, Conn.	4 Tyler Place.
Grunwaldt, Lucy Antoinette	Springfield	Abigail Adams House.
Gunn, Ralph Ellis	South Jacksonville, Fla.	Theta Chi.
Haley, Edward Fowler	Orange	Sigma Phi Epsilon.
Hall, Addison Smith	Ashfield	83 Pleasant Street.
Hammond, Clarence Elliot	Needham	Kappa Sigma.
Harris, Charles Whitcomb, Jr.	Leominster	Theta Chi.
Haubenreiser, Elsie Martha	Springfield	Abigail Adams House.
Hayes, Ernest Littlefield	Milton	9 Phillips Street.
Hernan, Richard Alden	Gilbertville	Q. T. V.
Hetherington, Thomas	Fall River	Sigma Phi Epsilon.
Hilbert, Alfred George	Chicopee Falls	13 North College.
Hinchey, Anne Elizabeth	Palmer	Abigail Adams House.
Howard, John Brooks, Jr.	Reading	Sigma Phi Epsilon.
Howard, Lucius Alexander	Ridgewood, N. J.	Phi Sigma Kappa.
Howard, Martin Stoddard	Northfield, Vt.	Phi Sigma Kappa.
Hunt, Kenneth Whitten	Arlington	Kappa Sigma.
Ives, Kenneth Gage	Amherst	West Street.
Jensen, Henry Wilhelm	Jamaica Plain	14 North College.
Johnson, Catherine Genevieve	Amherst	Eames Avenue.
Jones, Fred William	Otis	138 South Pleasant Street.
Joy, John Leo William	Amherst	3 High Street.
Kneeland, Ralph Folger, Jr.	Attleboro	9 South College.
Labarge, Robert Rolland	Holyoke	Kappa Epsilon.
Lake, Walter Sidelinger	Plainville	3 Fearing Street.
Lawlor, John Thomas, Jr.	Marblehead	86 Pleasant Street.
Leonard, John Morris	Fall River	Kappa Epsilon.
Loud, Miriam Johnson	Plainfield	Abigail Adams House.
Lynds, Lewis Malcolm	Taunton	Sigma Phi Epsilon.
MacCausland, Mabel Alice	West Newton	Abigail Adams House.
Madden, Archie Hugh [2]	Amherst	42 Lincoln Avenue.
Magnuson, Herman Rainville	Manchester	9 Phillips Street.
Mann, Raymond Simmons	Dalton	Sigma Phi Epsilon.
Manwell, Flora Eleanor	Williamsburg	Abigail Adams House.
Marcus, Theodore	Roxbury	East Experiment Station.
Maylott, Gertrude	Worcester	Abigail Adams House.
McChesney, Herbert Lewis	West Springfield	Kappa Sigma.
McIsaac, Donald Weston [1]	East Weymouth	1 North College.
Morowski, Earle Leo	Attleboro	Alpha Sigma Phi.
Morgan, Isabel Elvira	Schenectady, N. Y.	North Amherst.
Morse, Beryl Florence	Southbridge	Abigail Adams House.
Mullen, Edwin Joseph	Holyoke	Sigma Phi Epsilon.
Murphy, Donald Fraser	Lynn	13 Phillips Street.
Nickerson, Ralph Francis	Attleboro	Sigma Phi Epsilon.
Nims, Russell Everett	Greenfield	12 South College.
Noble, George Watson [2]	Pittsfield	Sigma Phi Epsilon.
O'Brien, Edward Alexander	Holyoke	10 South College.
Pagliaro, Sylvester	Mittineague	Kappa Epsilon.
Paksarian, John Paul	Franklin	Q. T. V.
Patch, Eldred Keene	Stoneham	The Davenport.
Paulson, John Edward	Holyoke	Kappa Epsilon.
Phinney, Paul Tirrell	Hyde Park	Kappa Sigma.
Pillsbury, William Gale	Amesbury	Theta Chi.
Pollin, Ida Edith	Sheffield	33 Lincoln Avenue.
Pottala, Arne Eric	Fitchburg	14 North College.
Pray, Francis Civille	Amherst	22 Sunset Avenue.
Purdy, Wilfred George	Merrimac	5 North College.
Pyle, Arthur Guard	Plymouth	Theta Chi.
Renaud, Hector Holmes	Walpole	15 Fearing Street.
Riley, Vincent Joseph	Somerset	Alpha Sigma Phi.
Robertson, Harold Miner	Leyden	The Davenport.
Ronka, Lauri Samuel [2]	Gloucester	7 North College.
Rudman, Paul Arthur	Agawam	53 Lincoln Avenue.
Sanborn, Alice Geneva	Attleboro	Abigail Adams House.
Sandstrom, Evelyn Cecelia	Auburn	Abigail Adams House.
Saraceni, Raphael	Lynn	13 Phillips Street.
Sederquist, Arthur Butman, Jr.	Lancaster	Theta Chi.
Shepard, Lawrence Moody [1]	West Boylston	Theta Chi.
Singleton, Eric	Brooklyn, N. Y.	Theta Chi.
Skogsberg, Frank Albert [1]	Worcester	Theta Chi.
Smith, Raymond Francis	Needham	101 Pleasant Street.
Smith, Winthrop Grant	Needham Heights	Kappa Sigma.
Spooner, Laurence Whipple	Brimfield	President's House.
Stacy, Paul	Webster	Q. T. V.
Stanford, Spencer Clarendon	Rowe	Alpha Sigma Phi.
Stanisiewski, Leon	Amherst	Triangle Street.
Stevenson, Errol Burton	Brockton	15 Phillips Street.
Stone, Ruth Winifred	Holyoke	Abigail Adams House.
Suher, Maurice	Holyoke	14 South College.

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[1] Candidate for degree of bachelor of vocational agriculture.
[2] Admitted on probation; entrance record incomplete.

Sullivan, William Nicholas, Jr.	Lawrence	5 North College.
Swett, Margaret Elizabeth	Gloucester	Abigail Adams House.
Swift, Gilbert Dean	Melrose	54 Lincoln Avenue.
Taft, Jesse Alderman	Mendon	Exp. Sta. Farmhouse.
Taft, Roger Sherman	Sterling	Alpha Sigma Phi.
Tank, John Richard	Chatham, N. Y.	Sigma Phi Epsilon.
Thatcher, Christine Belle	Cummington	10 Hallock Street.
Tiffany, Don Cecil	Cambridge	Kappa Sigma.
Tomfohrde, Karl Martin	West Somerville	Theta Chi.
True, Henry Harriman	Haverhill	66 Pleasant Street.
Wadleigh, Cecil Herbert	Milford	3 Fearing Street.
Waechter, Peter Hansen, Jr.	Walpole	French Hall.
Warren, Allen Johnson	New Haven, Conn.	Theta Chi.
Wells, Marie Evelyn	Pugwash, N. S.	Abigail Adams House.
White, Frank Tisdale, Jr.	Holbrook	81 Pleasant Street.
White, Harold James	Brighton	9 South College.
Wood, Priscilla Grover	West Bridgewater	Abigail Adams House.
Woodin, Elizabeth Marie	Adams	Abigail Adams House.
Yoblonsky, Samuel	Granby	Granby.
Young, Edward Henry	Northampton	Lambda Chi Alpha.
Zuger, Albert Peter	New Haven, Conn.	Alpha Sigma Phi.

Class of 1931.

Adams, Charles Streeter	Worcester	Theta Chi.
Aldrich, Walter James	Northfield	45 Pleasant Street.
Allen, Bertha Victoria	Holyoke	Abigail Adams House.
Baker, Walter Connor	Franklin	86 Pleasant Street.
Barnes, Gertrude Anges	Richmond	Abigail Adams House.
Barry, Elizabeth Evans	Lynn	Abigail Adams House.
Bartlett, Leonard, Jr.	East Walpole	45 Fearing Street.
Bartsch, Nelson Edgar	Waverley	Phi Sigma Kappa.
Beaman, Evelyn Armstrong	Leverett	Abigail Adams House.
Beaumont, Mary	Saxonville	Abigail Adams House.
Belden, Stearns Newton	Hatfield	8 Allen Street.
Bonney, Walter Twichell	Springfield	53 Lincoln Avenue.
Bosworth, William Ezra, Jr.	Holyoke	39 Fearing Street.
Bradley, Sally Elizabeth	Lee	Abigail Adams House.
Brooks, John Hapgood, 3d	Worcester	46 Pleasant Street.
Brown, Alfred Alexander	Methuen	51 Amity Street.
Buck, Wilbur Francis	Stockbridge	75 Pleasant Street.
Burke, William James, Jr.	Holyoke	66 Lincoln Avenue.
Burnham, Catharine Annette	Shelburne Falls	Care of A. Taylor, North Amherst.
Burnham, John[1]	Shelburne Falls	8 Allen Street.
Cahoon, Mildred Adeline	Centerville	Abigail Adams House.
Calvi, John	Athol	75 Pleasant Street.
Carpenter, Henry Dunphe	Bridgewater	53 Lincoln Avenue.
Chadwick, Alan William	Worcester	27 Fearing Street.
Church, Gertrude Barber	North Amherst	North Amherst.
Clarkson, Marjorie	Worcester	Abigail Adams House.
Coolidge, Marion Bernice	Petersham	116 Pleasant Street.
Costello, Richard Francis, Jr.	Franklin	86 Pleasant Street.
Cox, Frederick Elliot	Jamaica Plain	81 Pleasant Street.
Cucinotta, Lewis Bohlin	Camden, Me.	15 Phillips Street.
Dangelmayer, Wynton Reid	Waltham	7 Phillips Street.
Darling, Herbert Daniel	Blackstone	Baker Place.
Davis, Arnold Mearns	Berlin	Alpha Gamma Rho.
Davis, Charles Malcolm	Sharon	97 Pleasant Street.
Davis, George Merrill	South Lee	21 Fearing Street.
Davis, Richard William	Melrose	45 Fearing Street.
DeFalco, Iris Norma	North Adams	Abigail Adams House.
Digney, Anna Katherine	Dorchester	Abigail Adams House.
Douglass, Frank Taylor	Springfield	4 Nutting Avenue.
Doyle, Newman Bishop	Caribou, Me.	4 Chestnut Street.
Evans, Richard Warren[2]	North Attleborough	84 Pleasant Street.
Everson, Bettina Lowell	Amherst	North Pleasant Street.
Faille, Francis Joseph	Greenfield	8 South Prospect Street.
Field, George White	Florence	Care of Mrs. Mitten, Dana Street.
Field, Mabel Klose	Sheffield	Abigail Adams House.
FitzGerald, Paul Richard	Revere	Baker Place.
Flood, George Millard	North Adams	83 Pleasant Street.
Flood, John Henry	Lowell	81 Pleasant Street.
Fraser, Richard Arthur	Lowell	83 Pleasant Street.
Frey, Newell William	South Hadley Falls	75 Pleasant Street.
Friedrick, Thelma Selene	Florence	Abigail Adams House.
Frost, Edmund Locke	Arlington	5 Farview Way.
Gallagher, Philip Noel	Cambridge	Baker Place.
Gilgut, Constantine Joseph[2]	Athol	9 Phillips Street.
Goodrich, Raymond Eldred	Amherst	3 South East Street.
Gordon, Jeane	Holyoke	Abigail Adams House.
Gorman, Joseph William	Upton	6 Phillips Street.
Gower, Albert Hugh	Brighton	83 Pleasant Street.
Greene, Nathan Edward	Melrose	35 Lincoln Avenue.
Griffith, Janet Anne	Wareham	Abigail Adams House.
Guenard, John Robert	Dracut	5 Allen Street.

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[2] Admitted on probation, entrance record incomplete.

Gula, Joseph John	Bondsville	15 Hallock Street.
Hacker, Walter Breed	Wellesley	51 Amity Street.
Hamilton, Stephen Lane	New Salem	3 College Avenue.
Hanks, Harry Mason, Jr.	Longmeadow	81 Pleasant Street.
Hastings, Emory Barton	Athol	4 Chestnut Street.
Hathaway, Francis Brown	New Bedford	44 Sunset Avenue.
Hempel, Edward Charles, Jr.	Blackstone	42 Cottage Street.
Hickney, Zoe Edwina	Leicester	Abigail Adams House.
Hicks, Murray Ballou	North Adams	8 Allen Street.
Hines, Francis Martin	Arlington	45 Pleasant Street.
Holm, Carl Gustaf [1]	Worcester	2 North College.
Holmberg, Oscar Edward	Waltham	82 Pleasant Street.
Holmes, Ernest Russell, Jr. [1]	Worcester	3 Nutting Avenue.
Hoover, Sherman David	Providence, R. I.	83 Pleasant Street.
Hyland, Edgar Loring, Jr.	North Scituate	81 Pleasant Street.
Johnson, Arthur Clement Marriott	Greenfield	70 Lincoln Avenue.
Johnson, Erik Alfred	Springfield	13 Fearing Street.
Jones, Lawrence Arthur	Greenfield	11 South College.
Kane, Eugene Joseph	Westfield	8 Allen Street.
Keating, Alice Catherine	Northampton	Abigail Adams House.
Keene, Norman Eugene [2]	Somerville	Baker Place.
Kimball, Philip Wadsworth	Northborough	35 East Pleasant Street.
King, Kathleen Grace	South Amherst	South Amherst.
King, Lewis Emory	North Brookfield	15 Hallock Street.
Kingsbury, Kermit Kenton	Leominster	Theta Chi.
Kitner, William Robert	Westfield	29 North Prospect Street.
Koerber, Margaret Eleanore	Northampton	Abigail Adams House.
Kolonel, Jack Milton	Grand Falls, Newfoundland	81 Pleasant Street.
Lamb, Francis Bleakie	White Plains, N. Y.	3 Tillson Court.
Larson, Carl Hilding	Holden	35 North Prospect Street.
Lawrence, John Cheney	Brimfield	President's House.
Lawrence, John Frederick [1]	Brimfield	9 Phillips Street.
LeClair, Gertrude Leah	Southbridge	Abigail Adams House.
Little, Charles Lunt	West Medford	31 North Prospect Street.
Lockwood, Elvin Percy	Shelton, Conn.	81 Pleasant Street.
Loomer, Edward Alfred	Abington	4 Nutting Avenue.
Lorrey, Robert Henry [2]	Watertown	10 Nutting Avenue.
Lyman, Evelyn May	East Longmeadow	Abigail Adams House.
Mackenzie, Helen MacGregor	Roslindale	Abigail Adams House.
Mackimmie, George Ross	North Amherst	North Amherst.
Manty, Charles Weikko	Maynard	35 Lincoln Avenue.
Marshall, Mary Moore	Whitinsville	Abigail Adams House.
Mason, Frank Ford, Jr.	Pownal, Vt.	Care of C. W. Everson.
McAllister, Gordon Algo	North Billerica	21 Fearing Street.
McGoldrick, Virginia Mary	Lee	Abigail Adams House.
McGuckian, John William	Roslindale	31 North Prospect Street.
McKeen, Richard Potter	Watertown	22 Sunset Avenue.
Mead, Gertrude Alice	Townsend	Abigail Adams House.
Meyer, Beatrice Florentine	Amherst	R. D. No. 1, Amherst.
Minkstein, Thomas Edward	Westfield	3 Allen Street.
Moakley, John Francis	Dorchester	6 Phillips Street.
Monk, Marjorie	Watertown	Abigail Adams House.
Myrick, Norman	Longmeadow	75 Pleasant Street.
Nash, Albert, Jr. [1]	Greenfield	Care of F. C. Cooley, Sunderland.
Nash, Clyde Woodbury	Haverhill	31 Fearing Street.
Nason, David Mitchell	Medford	31 North Prospect Street.
Nelson, Harmon Oscar, Jr.	Whitinsville	17 Kellogg Avenue.
Nichols, Donald Theodore	Westfield	29 North Prospect Street.
Norell, Frieda Brita	Amherst	Amherst, R. D. No. 2, Box 55.
Northcott, John Warren, Jr.	New Bedford	84 Pleasant Street.
Nott, George Edwin	Brookfield	10 North College.
O'Leary, John Thomas, Jr.	Northampton	142 Crescent Street, Northampton.
Oliver, George West	Watertown	15 North College.
Olsson, Arnold William	Brockton	83 Pleasant Street.
Owers, Richard Myron	Taunton	9 Phillips Street.
Paille, Arthur Joseph	Attleboro	9 South College.
Parker, William Hooper	Gorham, Me.	Chestnut Street.
Patch, Lowell Harrison	Conway	232 Hinckley Street, Northampton.
Pierce, Gertrude Keith	Shelburne Falls	Abigail Adams House.
Pierce, Ralph Eugene, Jr.	Newton	Care of C. W. Everson.
Pilling, Thomas Linwood	Worcester	1 Baker Place.
Pinchuck, Lillian Ida	Holyoke	Abigail Adams House.
Plantinga, Martin Peter	Amherst	North East Street.
Potter, Rial Strickland, Jr.	Springfield	31 North Prospect Street
Powers, John Joseph	Newton Centre	86 Pleasant Street.
Priest, Arthur George	Windsor, Conn.	21 Fearing Street.
Pyenson, Louis	East Lee	15 South College.
Reuter, Anna May	Northfield	Eames Avenue.
Ribarsch, Edgar Reginald [2]	New York, N. Y.	13 Phillips Street.
Roberts, Frederick Kaeppel [2]	South Hadley Falls	42 Cottage Street.
Rollins, Emily Gerrish	Jamaica Plain	Abigail Adams House.
Rose, Harold	Sarnia, Ont., Can.	3 McClellan Street.
Rubin, Theodore	Brooklyn, N. Y.	56 Pleasant Street.

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Runvik, Kenneth Carl	Worcester	Apiary.
Russell, Grace Shirley	Easthampton	Abigail Adams House.
Salenius, Charles Henry	Hingham	97 Pleasant Street.
Sandow, John Ellenwood	Natick	7 Phillips Street.
Schultz, Raymond Edward	Westfield	3 Allen Street.
Scott, Ruth Elizabeth	North Hadley	Abigail Adams House.
Sears, Louis Alf	Ashby	53 Lincoln Avenue.
Shaw, Frank Robert	Belchertown	Belchertown.
Shea, Margaret Jennie	Northampton	232 Hinckley Street, Northampton.
Smith, Ernest Gordon	Medford	5 Farview Way.
Smith, Lawrence Holton	Amherst	158 South Pleasant Street.
Smith, Paul Augustus	Malden	53 Lincoln Avenue.
Somes, John	Otis	Care of Mrs. Everson.
Spiewak, Pauline Anna	Holyoke	Abigail Adams House.
Stoddard, Herbert Tilden	Cohasset	84 Pleasant Street.
Stuart, Robert Emerson	Littleton	8 Allen Street.
Sullivan, Pauline Eugenia	Bangor, Me.	Abigail Adams House.
Takahashi, Leopold Hanzo	Amherst	124 Hillside Avenue.
Tashjian, Louren Markar	Boston	14 McClellan Street.
Tetro, Robert Carl	Williamsburg	45 Pleasant Street.
Thayer, Richard Dudley	Shrewsbury	75 Pleasant Street.
Thompson, Edward Henry	New Brunswick, N. J.	83 Pleasant Street.
Thompson, Rufus Henney	Amherst	Mt. Pleasant.
Troy, Frederick Sherman	Arlington	45 Pleasant Street.
Upton, Shirley	North Reading	Abigail Adams House.
Vincent, Lionel Lewis	Westminster	M. A. C. Farmhouse.
Wahlgren, Hardy Lewis	Melrose	North Amherst, care of Archibald.
Waite, Harold Vita Montefiore[2]	Northampton	13 Belmont Place, Northampton.
Ward, George Alfred[1]	Saugus	86 Pleasant Street.
West, Allen Sherman, Jr.	Springfield	97 Pleasant Street.
Westendarp, Edwin Maurice	Saugus	83 Pleasant Street.
Wetterlow, Eric Hilding, Jr.	Manchester	15 Phillips Street.
Wherity, Richard White	Scituate	81 Pleasant Street.
White, Edwin Theron	Millbury	83 Pleasant Street.
Whittum, Frederick Kinsley	Springfield	57 Lincoln Avenue.
Wilbur, Benjamin	Woburn	M. A. C. Farmhouse.
Wilcox, Keith Hinton	Port Leyden, N. Y.	94 Pleasant Street.
Williams, Inez Wilhelmina	Brockton	Abigail Adams House.
Witt, Louis Alton	North Brookfield	61 Amity Street.
Wood, Virginia	West Bridgewater	Abigail Adams House.
Woods, James Joseph	Leominster	5 Allen Street.
Wright, Alexander Dennett	West Bridgewater	27 Fearing Street.

SPECIAL STUDENTS.

Bertenshaw, John Edward	South Easton	97 Pleasant Street.
Payne, Donald Tubbs	Dunstable	26 Fearing Street.
Whitchurch, Louis Edwin	Shelburne Falls	Shelburne Falls.

REGISTERED AFTER CATALOGUE FOR 1926–27 WAS PUBLISHED.

1926.

Drake, Dorothy Madeline	Somerville.

Special.

Thayer, Charles Hiram	Amherst.

SUMMARY BY CLASSES.

CLASS.	Men.	Women.	Total.
1928	95	21	116
1929	84	25	109
1930	115	31	146
1931	143	43	186
Specials	3	–	3
Totals	440	120	560

GEOGRAPHICAL SUMMARY.

Massachusetts	522	Pennsylvania	1
Maine	6	Florida	1
Vermont	3	Canada	2
Rhode Island	3	Newfoundland	1
Connecticut	6		
New York	10	Total	560
New Jersey	5		

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[1] Candidate for degree of bachelor of vocational agriculture.

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SHORT COURSE ENROLLMENT.

TWO-YEAR GRADUATES, 1927.

N. Armas Aalto	Osterville.
Ralph Welman Anderson	Dorchester.
Herman George Andrews	Southampton.
Donald Meredith Atwood	North Abington.
Ranald Ashley Belcher	North Abington.
Dorothy Dunbar Bennett	Watertown.
James Henry Bird	West Roxbury.
Harmen Boelsma	Hingham.
Charles Luther Bradley	East Lee.
Ruth Althea Bullard	Orange.
Arthur Webster Burrill	Wellesley.
William James Caffrey	Cromwell, Conn.
Kathleen Sara Callahan	Dorchester.
Curtis W. Chaffee	Pawtucket, R. I.
Frederick Brooke Cover	Lowell.
Roy Wentworth R. Elder	Belmont.
Lindley Felton	Marlborough.
Elmer Smith Fitzgerald	Leominster.
Kenneth Bullard Fullam	North Brookfield.
Merton Stewart Gale	Gardner.
Edward Ernest Gay, Jr.	Belchertown.
John Edward Gibbs	Nantucket.
Lyman William Graves	Conway.
George Winston Hall	Dudley.
Robert Francis Hallbourg	Westfield.
Thomas Arnold Hamilton	Fairhaven, Vt.
Michael Joseph Hannigan	Milford.
Louis Peter Hawkes	Buckland.
Francis Dean Hayward	Holden.
Edward Graham Hoxie	Dalton.
Bernard Holden Kenyon	Winchendon.
Andrew Gilmore Ketchen	Belchertown.
Stanley Emery Marks	East Lynn.
George Arthur Mason	Somerville.
Arthur Howard May	Bennington, N. H.
Mario Nicolai	Somerville.
Henning Olav Nielsen	Amherst.
Gustaf Carl Nilsson	Worcester.
Eugene Francis O'Neil	Amherst.
Alfred Henry Parker	East Pepperell.
Samuel Sumner Peabody	Manchester.
Ashley Houghton Pickard	Littleton.
Charles Randall Pitt	Bridgeport, Conn.
Alfred Edward Plude	Somerville.
Martha Elizabeth Pratt	Hadley.
Ruth Price	North Attleborough.
John Plimpton Roy	North Adams.
Raymond Earle Scott	Pepperell.
Lucius Colton Shepard	West Sterling.
Frederick Oliver Sime	North Weymouth.
Frank Pillman Smith	Somerville.
Roland Whipple Smith	South Hamilton.
Harold Edward Stewart	West Boylston.
Howard Arthur Sweet	Norton.
Archer William Vincent	Townshend, Vt.
Kenneth Rogers Vining	New Bedford.
Theodore Elias Waldo	Randolph Center, Vt.
Lawrence Philip Warren	Westborough.
Neil Buster Watson	Pittsburgh, Pa.
Janet Weeks	Somerville.
Oliver Adams Whitcomb	Littleton.
Morton Ernest Whithed	Bernardston.
Edwin Ervin Whitmore	Campello.
Ira Rigby Wile	New York, N. Y.
Rex Parker Winslow	Worcester.
Donald Frederick Woodbury	Sunderland.
Edwin Ralph Young	Worcester.
Frank Leo Zaik	North Brookfield.

SECOND YEAR TWO-YEAR STUDENTS, 1927-28.

Ashton, Richard Varnum	Ipswich	9 Fearing Street.
Baker, Daniel Wallace	Allston	17 Kellogg Avenue.
Ballard, Alden Chester	North Adams	Eames Avenue.
Batchelder, Warren Arthur	Stoughton	A. T. G., North College.

Bergman, Leroy Leonard	Orange	9 Phillips Street.
Bridges, Mildred Frances	West Brookfield	Abigail Adams House.
Butler, Bradford Henry	Feeding Hills	A. T. G., North College.
Butters, Alden William	Natick	A. T. G., North College.
Callahan, Eileen Mary	Dorchester	Abigail Adams House.
Clark, Robert William	Springfield	9 Fearing Street.
Cook, Errol Francis	Waltham	A. T. G., North College.
Crowell, Arthur Desmond	South Brewster	12 Chestnut Street.
Davis, Eber Hammond	Rutland, Vt.	Eames Avenue.
Dennett, John Bradford	Plympton	Kolony Klub.
Dodds, Richard Wright	Littleton	8 Allen Street.
Doherty, John Joseph	Woburn	– –
Doran, Robert Edward	Lexington	70 Lincoln Avenue.
Eldredge, Eunice Constance	Chatham	Abigail Adams House.
Elliott, George Ramon	Groveland	66 Pleasant Street.
Finerty, Richard Daniel	Waban	Kolony Klub.
Hancock, Joan	Montreal, Que., Canada	Abigail Adams House.
Hoffman, Ludwig	Rockville, Conn.	Kolony Klub.
Hovey, Stuart Woodbury	Dracut	A. T. G., North College.
Jewett, Lloyd Wendell	Middlebury, Vt.	Kolony Klub.
Johnson, Erling Christian	Everett	Box 36, North Amherst.
Kellogg, Charles Goodrich	Benson, Vt.	Kolony Klub.
Kimball, George Warren	Westford	9 Fearing Street.
Larned, Ruth Edwina	Amherst	North Pleasant Street.
Larson, Carl Philip	Hampden	Kolony Klub.
Lawson, Harry Leroy	Brockton	19 Phillips Street.
Lawson, Thomas Wing	North Dartmouth	Care of Prof. Sears, Mt. Pleasant.
Lopes, Frank Luce	Vineyard Haven	A. T. G., North College.
MacIntyre, John Wesley	Springfield	A. T. G., North College.
Maddocks, Lewis Henry, Jr.	Lowell	45 Fearing Street.
Marchant, John Chesley	Boston	Kolony Klub.
Mayberry, Harold Edmunds	Northborough	42 McClellan Street.
Mitchell, Ira Joel	Haverhill	84 Pleasant Street.
Mitchell, Samuel Stetson	Salem	A. T. G., North College.
Napoli, Thomas	Lexington	23 Cottage Street.
Nelson, Sidney Parkhurst	Jamaica Plain	Kolony Klub.
Olsen, Ralph Edwin	Waverly	A. T. G., North College.
Owens, Albert Joseph	Prospect Plains, N. J.	Kolony Klub.
Pazsit, Andrew Stephen	Mansfield	A. T. G., North College.
Petersen, Bradley Huston	Worcester	83 Pleasant Street.
Philadelphus, Gabriel Angelos	Watertown	50 Pleasant Street.
Poskitt, Frank Willard	Westborough	23 Cottage Street.
Prentiss, Harold Charles	Hubbardston	Care of Miss Dickinson, Byways, Pelham.
Puffer, Robert Edward	Saugus	A. T. G., North College.
Pulsifer, Howard George	Natick	Tillson Farm, M. A. C.
Rabouin, Henry Victor	Windsor	35 East Pleasant Street.
Randall, Alice Ravenia	Belchertown	Abigail Adams House.
Reed, Milton, 2d	Taunton	15 Hallock Street.
Reed, Myrton Starkey	Harvard	23 Cottage Street.
Ripley, John Cheney	South Weymouth	5 East Pleasant Street.
Roche, Gerald Brendon	Charlestown	56 Pleasant Street.
Rommell, George J.	Dorchester	73 Pleasant Street.
Saunders, Blanche M.	Brewster, N. Y.	Abigail Adams House.
Shea, Walter Thomas	Springfield	A. T. G., North College.
Stackpole, Alan Douglas	Arlington	Kolony Klub.
Starkweather, Oscar A.	Needham	5 East Pleasant Street.
Stockwell, Cecil Gordon	Grafton	4 Chestnut Street.
Stowell, Dwight Kenneth	New Salem	21 Woodside Avenue.
Taylor, Oscar Banks	Green's Farms, Conn.	Kolony Klub.
Wells, Arthur William, Jr.	Dracut	45 Fearing Street.
Wetmore, Herbert Alston	Worcester	66 Lincoln Avenue.
Wilcox, Philip Alan	Windsor, Vt.	Poultry Plant, M. A. C.
Willey, Giles Hyman	Essex Junction, Vt.	12 Chestnut St.
Winkler, Eleanor King	Wakefield	Abigail Adams House.
Wood, Francis Deane	Belfast, Me.	Eames Avenue.
Woodcock, Alfred Herbert	Daytona Beach, Fla.	52 Lincoln Avenue.
Woodhead, Paul Anthony	Chelmsford	41 Pleasant Street.
Wyman, Harold Frank	Leominster	Kolony Klub.
Yarrows, Frank Joseph	Hatfield	Kolony Klub.

FIRST YEAR TWO-YEAR STUDENTS, 1927–28.

Aseltine, Merritt Lester, Jr.	Mittineague	18 Cottage Street.
Ashworth, Servetus Thomas	Westborough	23 Cottage Street.
Barnes, Howard Dudley	Roslindale	5 East Pleasant Street.
Baxter, Joseph Chisholm	Dorchester	Baker Lane.
Bayrd, Norman Atwell	Wakefield	1 Cottage Street.
Beals, George Chelsea	New Britain, Conn.	Baker Lane.
Belden, Allen Montgomery, Jr.	Springfield	14 McClellan Street.
Belden, Elbridge Francis	Woburn	35 East Pleasant Street.
Blackinton, Russell Pentecost, Jr.	Chepachet, R. I.	Baker Lane.
Blackwell, Arthur Ramsdale	Wellesley Hills	1 Cottage Street.
Boothby, Lloyd Meserve	Randolph	101 Pleasant Street.
Brackley, Kenneth Malcom	Strong, Me.	75 Pleasant Street.
Bragdon, Dudley Acton	St. Louis, Mo.	6 Boltwood Avenue.
Braun, Robert	Holliston	15 Fearing Street.
Brooks, George Nelson	Allston	46 McClellan Street.
Brown, James Francis	Lowell	31 Cottage Street.

Brown, Thurl Dryden	Danvers	86 Pleasant Street.
Brown, Winsor Cargill	North Attleborough	Baker Lane.
Burnham, Harry Lester	West Springfield	Baker Lane.
Burt, Francis Henry	Vineyard Haven	3 McClure Street.
Butler, Arthur Anthony	Dedham	67 Pleasant Street.
Cagney, Thomas Gerard	Manchester	108 Pleasant Street.
Cheney, Oliver Franklin	Framingham	Baker Lane.
Connell, Arthur James	Boston	86 Pleasant Street.
Constain, Marco Aurelio	Popayan, Columbia, S. A.	Baker Lane.
Cottrell, Merton Ashley	Middlefield	86 Pleasant Street.
Coutu, Wilfred Louis	Cambridge	31 Cottage Street.
Crissman, Joseph Robinson	Punxsutawney, Pa.	86 Pleasant Street.
Crowley, Denis, Jr.	Quincy	22 Hillside Avenue.
Dibble, Lysleford Arthur	West Springfield	18 Nutting Avenue.
Dillaway, Clara Louise	Newton Highlands	Abigail Adams House.
Doane, Clifford Walen	Manchester	Baker Lane.
Dunklee, Leon Leroy	South Hadley Falls	– –
Eldredge, Keith Graham	Sagamore	61 Amity Street.
Engelmann, Harold M.	Pittsfield	108 Pleasant Street.
Ewart, Thomas Lewis	Newton Highlands	68 Lincoln Avenue.
Eyberse, John Martin	Manchester	108 Pleasant Street.
Fahey, Lawrence James	Easthampton	60 Pleasant Street.
Farmer, Robert Lyle W.	Tewksbury	68 Lincoln Avenue.
Fay, Edward Thomas	Dorchester	56 Pleasant Street.
Flavin, Charles Joseph	Whately	60 Pleasant Street.
Fleming, James Delbert	Ashland, N. H.	Care of Mr. Toole, East Pleasant Street.
Foord, Betty Law	Amherst	54 Lincoln Avenue.
Franklin, Paul Lawrence	Springfield	3 Nutting Avenue.
French, William Brown	Granby	Care of Mr. Carey, North Pleasant Street.
Fuller, Albert Henry	Ludlow	18 Cottage Street.
Gale, John Harper	Tewksbury	68 Lincoln Avenue.
Gallagher, Edward Francis	Lenox	15 Hallock Street.
Gillis, Archie James	Manchester	35 East Pleasant Street.
Goodwin, Roland J.	Holyoke	3 Hallock Street.
Gorham, Edward Francis	South Braintree	46 McClellan Street.
Graf, Henry, Jr.	Newburyport	84 Pleasant Street.
Graves, Kenneth Batchelder	Conway	9 Mt. Pleasant.
Greene, Albert Melville	Ashland	18 McClellan Street.
Greenough, Harry Wellman	Lunenburg	4 Hallock Street.
Hall, Bertrand Augustus	Amherst	24 McClellan Street.
Hall, John Woodbury	Ballard Vale	22 Sunset Avenue.
Hartness, Henry John	Sutton	22 Hillside Avenue.
Hermann, William Tolle	Newton Centre	Care of Mr. Toole, East Pleasant Street.
Herron, Margaret	Greenfield	Abigail Adams House.
Hero, George Wilmarth	Westborough	42 McClellan Street.
Hobart, Edward Pickering	Duxbury	66 Pleasant Street.
Holder, Eben Daniel	Berlin	67 Pleasant Street.
Hoyt, Herman Francis	West Newton	4 Hallock Street.
Hulbert, Gordon Chesley	Holliston	15 Fearing Street.
Hull, George Irvin	Carlisle	61 Amity Street.
Joslin, Elliott Proctor, Jr.	Oxford	46 Pleasant Street.
Kelley, Milton Everett	Ashland, N. H.	35 East Pleasant Street.
Kelley, Paul Haynes	Orange	14 McClellan Street.
Kendrick, Earle Spencer	Everett	35 East Pleasant Street.
King, Lewis Emory	North Brookfield	15 Hallock Street.
Koch, Louise Margaret	Turners Falls	– –
Leland, Robert Arthur	East Bridgewater	35 East Pleasant Street.
Lincoln, George Thomas	Barre	3 Nutting Avenue.
Lyman, Donald Burt	Westhampton	3 Hallock Street.
Macfarlane, Robert Hollis	Durham, N. H.	8 Nutting Avenue.
MacKissock, William	Lowell	75 Pleasant Street.
MacKissock, Robert Roy	Lowell	75 Pleasant Street.
Masciocchi, Emilio A.	Roxbury	Baker Lane.
Mayo, Walter Howard	East Orleans	17 Kellogg Avenue.
McCarthy, George William	Northampton	– –
McConvill, William	North Dartmouth	50 Sunset Avenue.
McIntire, William Wilson	Lowell	3 Hallock Street.
McLay, Raymond Swinton	North Adams	15 Hallock Street.
Mead, Henry Osborn	Springfield	86 Pleasant Street.
Mongillo, Frank Anthony	Southington, Conn.	46 McClellan Street.
Moore, Fred Stanislaus, Jr.	Brighton	8 Kellogg Avenue.
Newton, Philip Aldrich	Somerville	73 East Pleasant Street.
Noble, Leon Holcomb	East Hartford, Conn.	46 McClellan Street.
O'Neil, Horatio Chandler	Duxbury	18 Cottage Street.
Osgood, Gardner Seabury	North Dartmouth	3 Hallock Street.
Parker, Carl Irving	South Lancaster	Kolony Klub.
Parker, John Barry	Brookfield	19 Main Street.
Parkinson, Leonard Raymond	Springfield	86 Pleasant Street.
Parks, Stillman Harding	Gloucester	Care of Mr. Toole, East Pleasant Street.
Pellett, Leonard Arthur	Gardner	101 Pleasant Street.
Perkins, Frank Redick	Lexington	35 East Pleasant Street.
Pettijohn, Louise Virginia	Amherst	18 Spring Street.
Phelps, Noel Cornell	Lexington	70 Lincoln Avenue.
Philbrick, Richard Staigg	Woburn	31 Fearing Street.
Plumb, Murray Edgar	Springfield, Vt.	8 Nutting Avenue.
Pratt, Clarence Albert	Bernardston	31 North Prospect Street.

Redmond, Thomas Allen	Boston	18 Cottage Street.
Rees, Emily Morse	Amherst	35 East Pleasant Street.
Robbins, Wight L.	Stoneham	56 Pleasant Street.
Robinson, Donald Edward	Roslindale	86 Pleasant Street.
Robison, William Edward, Jr.	Holyoke	3 Hallock Street.
Roundy, Glenn Hay	North Billerica	31 Fearing Street.
Russo, Nicholas Belmont	Fitchburg	22 Hillside Avenue.
Sherburne, Frances	Concord	33 Lincoln Avenue.
Sherman, Richard Morse	Southbridge	1 Cottage Street.
Sherwin, Wilbur Richard	West Townsend	18 Cottage Street.
Skovron, Peter	Newburyport	101 Pleasant Street.
Smead, Harold Louis	Greenfield	70 Lincoln Avenue.
Smith, Austin James	South Londonderry, Vt.	31 North Prospect Street.
Smith, John Francis	Westborough	10 McClellan Street.
Snell, Alwyn Gayner	Brockton	3 Nutting Avenue.
Stevens, Clarence Eugene	Marlborough	18 Nutting Avenue.
Stevens, Thornton	Norwood	86 Pleasant Street.
Stone, Ralph Edgarton	Beverly	81 Pleasant Street.
Sullivan, Agnes Nora	Palmer	31 Lincoln Avenue.
Sylvia, Joseph Frates	Mattapoisett	3 McClure Street.
Tinkham, Charles Warren	Bennington, Vt.	75 Pleasant Street.
Townsend, Donald Francis	Salem	49 East Pleasant Street.
Van Norman, Louis Edwin, Jr.	Washington, D. C.	19 Main Street.
Webb, George Nelson	Stonington, Me.	17 Kellogg Avenue.
Weston, Gordon Worth	Cambridge	31 Cottage Street.
White, Kenneth Baker	West Hawley	4 Hallock Street.
White, Lincoln	Abington	Kolony Klub.
Witherell, William Clayton	Taunton	35 East Pleasant Street.
Woodger, James Henry	Sheffield	22 Sunset Avenue.
Young, Ralph Preston	Brookfield	31 Cottage Street.
Young, Robert Augustus	Norton	35 East Pleasant Street.

Vocational Poultry Course, 1927.

Allen, Herbert Marsena	Haverhill.
Johnson, Herbert Fox	Allston.
Metcalf, Earl D.	Weld, Me.
Morse, Luther Edison	Lynn.

Winter School, 1927.

Anderson, Arthur E.	Fitchburg.
Barney, Algernon M.	North Swansea.
Barrows, William B.	Amherst.
Bruno, Patrick C.	Revere.
Campbell, Edward N.	Cliftondale.
Carlson, John	Northampton.
Ciccone, Alfred H.	South Barre.
Clinton, Blanche	Canton.
Clinton, John A.	Canton.
Cohen, Morris N.	Raynham.
Donnellan, James C.	Dorchester.
Dowdell, Charles	Milford.
Dowdell, Sidney M.	Holliston.
Duclos, Milton H.	West Somerville.
Duggan, Philip	Warren.
Eliades, Stephen	Littleton.
Farmer, Robert E.	Weldon, Iowa.
Gold, Abraham	Rocky Hill, Conn.
Guild, David	Mount Vernon, N. H.
Hager, Clayton M.	Somerville.
Hannigan, William E.	Fitchburg.
Heald, Jay M.	Lincoln.
Jameson, John H.	Bangor, Me.
Kehoe, Joseph G.	Morton Mills, Vt.
Kelton, George H.	Hubbardston.
Knapik, Paul	Westfield.
Kraemer, Carl A.	Clinton.
Lahey, Lawrence L.	Plymouth.
Levine, Max S.	Ashley Falls.
Lupien, Waldo E.	Newton Upper Falls.
Lynch, George F.	Shirley.
MacKenzie, Myrtle	Norwood.
Mason, Reginald G.	Chesham, N. H.
Mohan, Thomas E.	Canton.
Monk, Stanley E.	Auburn, Me.
Oppy, Jules P.	Brookline.
Oxton, Ralph A.	Cambridge.
Page, A. H.	Framingham.
Peabody, Herbert C.	Lunenburg.
Phinney, Edward B.	Sagamore.
Russell, Charles M.	New Bedford.
Ryan, Martin M.	Northborough.
Sawitzky, Alfred J.	Billerica.
Sedgely, Arthur D.	Lewiston, Me.
Shorey, Herbert M.	Wollaston.
Studley, Joshua	Rochester, N. H.
Warren, George C.	Arlington.
Wason, George F.	Hingham.
Winslow, Benton	Mansfield.

SUMMER SCHOOL, 1927.

Graduate School Students.

Allen, Thomas S.	Belchertown.
Bourgois, Florence	Williamstown.
Bower, James, Jr.	Holyoke.
Brewster, Sam. F.	Belton, Tex.
Brockway, Alice M.	South Hadley.
Carlson, Oscar E.	Amherst.
Connors, Charles H.	New Brunswick, N. J.
Cowing, William A.	West Springfield.
Davis, Josephine E.	Holden.
Dowd, William L.	North Amherst.
Dye, Arthur P.	Morgantown, W. Va.
Evans, Mildred W.	Cambridge.
Frye, Florence M.	South Hadley Falls.
Gilbert, Chauncey M.	Amherst.
Goodwin, William I.	North Amherst.
Griffiths, Francis P.	Seattle, Wash.
Hanscomb, George W.	Ortega, Fla.
Hanscomb, Mary T.	Ortega, Fla.
Harris, Hugh K.	Temple, Tex.
Horne, Robert S.	Amherst.
Jones, Mrs. Mildred W.	Amherst.
Kenney, Irene C.	Amherst.
King, Cordelia B.	Northampton.
Lanphear, Marshall O.	Amherst.
Linehan, Mary D.	Amherst.
McCormick, Eileen M.	Holyoke.
Moody, Richard E.	Minotola, N. J.
Moran, John	Amherst.
Moriarty, Helen E.	Holyoke.
O'Brien, Mary C.	Greenfield.
O'Connor, Mary	Northampton.
O'Shea, Agnes V.	Northampton.
Pulley, Marion G.	Amherst.
Putnam, Ernest T.	Greenfield.
Rae, Florence J.	Holyoke.
Rivnay, Ezekiel	Holyoke.
Scott, Lorena C.	North Hadley.
Shea, Mary M.	Holyoke.
Smith, Marcus S.	Springfield.
Sylvester, A. Clayton	Merrimac.
Turner, Charles E.	Springfield.
Webber, Clarice V.	Springfield.
Wildon, Carrick E.	Kingston, R. I.
Wilkins, Roland L.	North Gay, Me.
Williams, J. Lowell	Sunderland.
Witt, Earl M.	Belchertown.
Wolfe, Benjamin F.	Norman, Oklahoma.
Wright, Ellen S.	Deerfield.

ENROLLMENT — NOT GRADUATE SCHOOL.

Ames, Laura M.	Revere.
Arel, Mrs. Harriet H.	Gardner.
Atkins, Dorothy G.	Revere.
Atkins, Joseph K.	Revere.
Bates, Ira S.	Whitinsville.
Bergan, Carl A.	Northampton.
Bergeron, Louise M.	Ludlow.
Bishop, Ruth F.	West Springfield.
Blanchard, Esther H.	Whitman.
Bottomly, Bruce E.	Worcester.
Bradford, David C.	Springfield.
Brown, Marguerite	Amherst.
Brown, Stephen	Northampton.
Carbee, Ruth M.	Roxbury.
Chapman, Gean M.	Bradford.
Church, Gertrude	North Amherst.
Church, Marcia G.	North Amherst.
Coldwell, Archibald G.	Lynn.
Cordes, Warren P.	Florence.
Cook, Florence M.	Westwood.
Dacey, Margaret	Conway.
Daniel, Harry E.	Orangeburg, S. C.
Denton, Ian O.	Norton.
Devine, John W.	Arlington.
Dickinson, Mabel H.	Holyoke.
Dillon, Claire E.	Holyoke.
Dolan, Mary C.	Quincy.
Drake, Dorothy M.	Somerville.
Draper, Mrs. Nellie P.	Auburndale.
Dutton, Alice M.	Hardwick, Vt.
Dwyer, Eleanor	Sunderland.
Ekberg, Ebba E.	Dedham.
Emery, Helen B.	Marlborough.
Fenton, Mary B.	Northampton.
Fish, Laura	Amherst.
Freeman, Jane E.	Springfield.

Gagliarducci, Anthony	Springfield.
Giles, Marian B.	Northampton.
Goodyear, Grace E.	Sunderland.
Graves, Bessie M.	Southampton.
Hallbourg, Robert F.	Westfield.
Haskell, Frances B.	Medford.
Hatch, Herbert T.	South Hanover.
Hawks, Marguerite L.	Northampton
Hawley, Edna B.	Amherst.
House, Zilpha A.	Springfield.
Hyde, William E.	Amherst.
Johnson, Catharine G.	Amherst.
Jones, Janet M.	Amherst.
Kane, Mrs. Margaret F.	Springfield.
Kelly, Gertrude C.	Holyoke.
Keough, Marguerite E.	Holyoke.
Kessner, Anne	Conway.
Kopena, Elizabeth A.	Conway.
Lane, Mrs. Helen D.	Worcester.
Layton, Emmet J.	St. Louis, Mo.
Lee, Edith M.	Amherst.
Lenigan, Margaret L.	Holyoke.
Loomis, Kathryn N.	Northampton.
Lucey, Margaret E.	Holyoke.
Marx, Walter H.	Holyoke.
McDavitt, Mrs. Lura H.	Westfield.
McMullen, Anastasia U.	Watertown.
McNally, Alice	Roxbury.
Medve, Elizabeth	Methuen.
Mulhern, Daniel J.	Roslindale.
Mullen, Francis R.	Becket.
Murray, Catherine	Adams.
Neal, Mary E.	West Roxbury.
Nelson, Hilmer S.	South Weymouth.
Neylan, Edith E.	Ayer.
O'Brien, Katharine M.	Dorchester.
O'Leary, Alice C.	New Bedford.
Patten, Louise	Springfield.
Perley, Sadie	Amherst.
Preble, Laura E.	Dorchester.
Preston, Stanley N.	Hathorne.
Redgrave, Arnold	Hopedale.
Reid, Mary E.	Worcester.
Roulston, Alice G.	Mattapan.
Rundquist, Edna J.	Gloucester.
Rutan, Huntington	North Hadley.
Ryan, Brigid A.	Sunderland.
Ryan, Parker	Swampscott.
Shaffer, Rose P.	Hopedale.
Sherry, Rita M.	Milton.
Shumway, Sara	Monson.
Spies, Naomi J.	Holyoke.
Stedman, Mrs. L. D.	Gardner.
Stone, Mabel A.	Northampton.
Sullivan, Marie B.	Holyoke.
Thompson, Arthur R.	West Bridgewater.
Totman, Ruth J.	Conway.
Warner, Frances A.	Amherst.
Warner, Irene C.	Amherst.
Whiton, Mrs. Florence J.	Springfield.
Witt, Dorothy V.	Granby.
Witt, Mrs. Ruth G.	Belchertown.
Wright, Elizabeth C.	Northampton.
Wright, Ethel A.	Newton Center.
Zielinski, John B., Jr.	Holyoke.

STUDENTS REGISTERED AFTER THE CATALOGUE FOR 1926–27 WAS PUBLISHED.

Two-Year Course.

Hamilton, Thomas Arnold	Fairhaven, Vt.

SUMMARY OF SHORT COURSE ENROLLMENT.

	Men.	Women.	Total.
Two-Year Course, second year	65	8	73
Two-Year Course, first year	125	8	133
Vocational Poultry Course	4	–	4
Winter School, 1927	47	2	49
Summer School, 1927	53	96	149
Totals	294	114	408

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M. S. C.
COLLECTION

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AMHERST, MASSACHUSETTS

VOLUME XX FEBRUARY, 1928 NUMBER 2

PUBLISHED EIGHT TIMES A YEAR BY THE MASSACHUSETTS AGRICULTURAL COLLEGE: JAN., FEB., MARCH, MAY, JUNE, SEPT., OCT., NOV. ENTERED AT THE POST OFFICE, AMHERST, MASS., AS SECOND CLASS MATTER

THE SIXTY-FIFTH ANNUAL REPORT OF THE MASSACHUSETTS AGRICULTURAL COLLEGE

Issued in Accordance with Section 8, Chapter 75, of the General Laws

PART I.—THE REPORT OF THE PRESIDENT AND OTHER OFFICERS OF ADMINISTRATION FOR THE FISCAL YEAR ENDED NOV. 30, 1927

DEPARTMENT OF EDUCATION
THE COMMONWEALTH OF MASSACHUSETTS

Publication of this Document approved by the Commission on Administration and Finance

3M-4-'28. No. 1914

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MASSACHUSETTS AGRICULTURAL COLLEGE

REPORT OF THE PRESIDENT TO THE BOARD OF TRUSTEES, 1927

REVIEW OF THE YEAR

The Massachusetts Agricultural College has again changed its chief executive. President E. M. Lewis resigned on August 31, 1927 to accept the Presidency of the University of New Hampshire and in his place you have appointed me to become tenth president of this institution. President Lewis had served the college long and well and it seems appropriate to recall here some of this service. He was called to the college in 1911 by President Butterfield to become Assistant Professor of English and Assistant Dean. Through the years his responsibilities were increased as implied by the following changing titles: Associate Dean and Professor of Literature, Dean and Head of Department of Language and Literature. Twice he was called upon to serve as Acting President for extended periods in the absence of President Butterfield and upon the resignation of the latter in 1924 he was again asked to accept this responsibility. Later he was made President of the College. The call to New Hampshire came so soon, however, that his service as such lasted for only one year. Undoubtedly President Lewis' greatest contribution to the permanent welfare of the college was the smoothing out of the fiscal relationships of the college and the establishment of many friendly contacts with state administrative officers which have greatly facilitated the administration of college affairs. He also organized an intensive study of the curriculum by the faculty committee on course of study. This has already resulted in some revision, and other changes which seem to be advantageous are in sight. President Lewis has often assured me of his continued interest in and love for the college, and I am sure that we can always count upon his loyal support.

I am pleased to note that your Board departed from custom and this year awarded the first honorary degree ever bestowed by the college and conferred the degree of Doctor of Laws upon President Lewis in recognition of his splendid service to the institution and the Commonwealth.

The Inauguration of the President

The committee of the faculty under the chairmanship of Dean Machmer cooperating with a committee of the Board of Trustees arranged a very impressive inaugural program which was held on October 28. The College was honored by the presence of official delegates from 62 institutions. Many alumni and friends of the college also attended. The President was officially installed by the State Commissioner of Education, Dr. Payson Smith, who represented the Governor of the State. Dr. Daniel L. Marsh, President of Boston University, spoke on behalf of the official delegates; Professor Frank A. Waugh spoke on behalf of the faculty. The alumni were officially represented by Philip F. Whitmore, President of the Associate Alumni, and the undergraduates by John M. Quinn, President of the Student Senate, each of whom spoke appropriately for the occasion. The academic procession in which visiting delegates, faculty, students, and alumni took part was a very colorful and impressive event. The banquet to official delegates in the evening and the splendid program at that time was a very fitting conclusion to an enjoyable event which I hope may prove to be a significant one in the history of the college.

Student Enrollment

Eight hundred and ten students were enrolled in resident courses this fall. This is the largest enrollment in the history of the college with the single exception of the year 1921. In that year there were a large number of ex-service men enrolled for vocational training under the supervision of the Federal Government. This made a somewhat abnormal condition which existed for several years, but has now been terminated. Not since 1916 have there been so many students enrolled in collegiate courses. However, this gain is largely in women students, there being 142 women enrolled this year. While there are more students than ever before, the type of enrollment has changed considerably. There are this year 474 men in the four-year course, 194 men in the two-year course, 126 women in the four-year course, and 16 women in the two-year course. That is, there are only six more men in the four-year course than in 1926 and 206 fewer than in 1917. While this year's freshman class is slightly larger than that of last year, it includes seven fewer boys than did last year's class. The opportunity for a sound college education for young men is still here, and in view of the general increasing demand for such education we may well ask why the enrollment of men students in the four-year collegiate course is not increasing.

Housing Facilities

The increasing enrollment makes more serious the long standing problem of housing students. The capacity of private homes in Amherst is apparently taxed to the maximum. It was necessary this year to arrange emergency accommodations in the attic of North Dormitory for those who registered late in the two-year course. Rooms off campus could not be found for them and every other facility was in use. This scarcity of rooms for students has led to other difficulties. The prices charged in many cases are exorbitant and in some cases the rooms rented to students are not suitable from a health standpoint. One case was recently reported to me in which a student was renting a very small room which had been made by putting a temporary partition across the end of a second floor hallway. The only heat for the room was the indirect heat from the hall and for this accommodation he was paying $5.00 per week. This room is more than one-half mile from the Campus. It seems to me that this is one of the most pressing of the problems with which we are confronted. The present condition needs immediate correction, and any further growth of the college is directly limited by this lack of housing facilities. You have included in your budget for special appropriations for this year an item of $150,000 for the erection of a dormitory. If granted, this will solve this problem for a considerable time. If, however, the State is not prepared to provide further dormitory equipment at the College, some other means of providing more and better housing facilities must be found.

Physical Education Building Project

Another pressing need, which I have already discussed with you as a factor limiting the further growth of the college is the lack of adequate physical education equipment. The college ought not to accept more students until it is properly equipped to give them essential training in physical education. Even the present program for students is greatly handicapped because of a lack of this equipment. The alumni have recognized this need and have organized to promote a project for a new physical education building which will remedy this deficiency in our physical plant equipment. Representatives of the alumni have conferred with the trustees and I hope that these two groups may work together to meet this pressing need of the institution.

Acquisition of Additional Land

Negotiations have been carried on since 1909 with the Q. T. V. Corporation looking toward the purchase of a 3½ acre parcel of land on Lincoln Avenue which is now completely surrounded by college land and which has always been a logical part of the campus. For one reason or another, however, through all these years no agreement has been consummated. I am pleased to report now, however, that the prospects for an agreement are favorable. The Corporation has set a price which has seemed to college authorities and to representative state officials to be a fair one. The trustees have included an item in the budget to cover the purchase, and it is to be hoped that the matter will be cleared up before the end of another year.

There is also included in the current budget an item of $800 for the purchase of land contiguous to the college property at the Cranberry Field Station at Wareham. This is a much needed acquisition and the time is apparently ripe for its purchase. It is to be hoped that nothing will interfere with the consummation of this purchase.

Classification of Personnel

The project for classification of personnel by the Commonwealth, referred to in President Lewis' report of last year, has been completed during the year and I am glad to report that, in general, this classification is quite satisfactory to the college. It provides for a general raising of standards in our clerical and professional service. This has been recognized for some time as a real need as indicated by the large turnover in personnel. The classification gives recognition also to the difference in services rendered by resident teachers and by experiment station and extension service employees. Since employees in the latter two groups give eleven months of service per year, they are classified at a somewhat higher range in parallel grades in order to compensate them in some degree for this longer period of service as compared with the nine months' service of the resident teacher. In the lower grades particularly the salaries which are now established at this institution compare very favorably with those of the best institutions of our kind.

There are still some adjustments which need to be made under this classification. It appears that a few positions have been incorrectly classified. It is hoped that these adjustments may be made during the coming year. One of the principles of the classification is that all new appointments should begin at the minimum for the grade. This is a reasonable requirement. There will probably be cases, however, in which it will be necessary to ask for a higher entrance salary than the established minimum in order to secure the person who may be needed to fill a vacancy. I am confident that in such cases we may expect an unprejudiced hearing and a just decision from the Division of Personnel and Standardization.

Terms of Employment

During the year revised statements of the terms of employment for the professional staff and for the clerical staff were prepared and with your approval were put into force. While no very significant change was made in these terms of employment, they have made possible a definite understanding between the college and each new appointee concerning conditions of employment and of service. This had not been generally accomplished heretofore.

Professional Improvement

Continuing President Lewis' discussion of last year concerning this problem I should report that the practice has been continued of allowing the privilege of out-of-state travel to meetings of professional societies on the basis of paying one-half the expense of the trip from college funds. Nine members of the faculty took trips on this basis during the year at a total cost to the college of $370. In addition, thirty-five persons travelled outside the state for various administrative purposes, conferences concerning institutional policies or research programs, etc., with full expenses paid by the college, at a total cost of $1,700. In many cases, the experience gained in this way is a very real contribution to the professional improvement of the individual concerned. This is, I believe, a very important way in which the college assists members of the staff in their professional improvement.

In addition, the Cabinet, representing the faculty, has recently approved a plan for and promulgated definite regulations concerning study by staff members in the Graduate School for professional training leading to advanced degrees. Under this plan staff members in the grades below that of associate professor are permitted to pursue graduate study here, upon the approval of their department head and the President of the College and upon the acceptance of the candidate by the Graduate Staff. Assistant professors are permitted to take graduate work only in departments other than those in which they themselves are giving service. Instructors are allowed freely the privileges of the Graduate School. This plan should further assist our staff members in their efforts for professional improvement.

A matter of encouragement to older members of the faculty was provided in the action of your Board this year in establishing the Emeritus rank for retired professors. Such rank is to be conferred without reference to retirement pay of any sort upon those retired professors whom the trustees may approve as being eligible to receive it.

Resignations and Appointments

Thirty-eight persons have left the professional and clerical service of the institution during the year. Twenty of these have gone from the clerical service and eighteen from the professional groups. This is an unusually large turnover in staff. I am sure we may hope for a more stable condition in the future now that we have a definite understanding as to salary ranges and terms of employment. Among the more significant resignations are those of E. L. Ashley, Professor of French, who had served the institution since 1908; R. J. McFall, Extension Professor of Agricultural Economics, whose service dates from 1920, although much of his time and efforts of recent years were given to the United States Department of Agriculture, while on leave of absence from this institution; Lewell S. Walker, Assistant Chemist in the Experiment Station, resigned after 21 years of service to the institution; Paul W. Viets, Supervisor of Placement Training in the Short Courses, resigned after six years of service. The significance of this last mentioned resignation is pointed out in the report of the Director of Short Courses.

In Memoriam — Prof. Charles E. Marshall

The death of Prof. Charles E. Marshall on March 20th brought a distinct loss to the institution. Dr. Marshall was in active service as Head of the Department of Microbiology and Director of the Graduate School of the College, having served in these capacities since 1912. He was called to this institution at that time from his position as Scientific Director and Vice-Director of the Agricultural Experiment Station at Michigan State College, to organize the Graduate School here. Graduate study had been offered at this college for some eighteen years but it was unorganized and unstimulated until Dr. Marshall took over its direction in 1912. Since that time it has grown from a school of two or three pupils to one of about fifty students, which is nationally recognized for its high attainments in scientific fields. Its growth and reputation are largely attributable to Dr. Marshall's high ideals.

Course of Study

President Lewis called your attention last year to the need for a revision of the four-year course of study. Some steps in this direction have been taken during the year which should be reported. Three courses were discontinued as possible major elections; namely, microbiology, rural sociology and agronomy. The courses for the freshman and sophomore years were modified by faculty action in such a way as to reduce the number of credits required to be earned during the two years. The faculty committee on course of study has become convinced that there has been a too wide diversification in the course of these two years, and that it would be advantageous to concentrate on fewer credit requirements. By the new schedule the freshman course is reduced from an average of 21 credits per term to 18 and the sophomore course from an average of 20 credits to 18. It seems probable that this will be an influence for a better quality of work by the students. The faculty committee is of the opinion that the next desirable step in modification of the curriculum is to broaden out the lines of major study in the junior and senior years so that the requirements may be not quite so inflexible and a student may be allowed freer opportunity to choose courses under the guidance of his major advisor. The committee has, in fact, given serious consideration to the advisability of establishing major groups which are combinations of present departmental majors. If this action is finally decided upon, it will provide for certain general requirements for graduation from each major group which will reflect the institutional standards and conception of collegiate education accompanied by opportunity for elective selection of such specialized vocational training as each student may desire.

As representing the present trend in student choice of courses of study at this college, the following comparative statement of major elections for the past six years is presented:

1922 . . .	An. Hus. 17	Ag. Ec. 15	Chem. 13	Pom. 11
1923 . . .	Pom. 20	Ag. Ec. 17	An. Hus. 12	Land. Gard. 11
1924 . . .	Ag. Ec. 16	Pom. 15	An. Hus. 9	Land. Gard. 9
1925 . . .	Ag. Ed. 17	Ent. 13	Land. Gard. 12	An. Hus. 11
1926 . . .	Ag. Ed. 18	Land. Gard. 15	Chem. 13	Pom. 9
1927 . . .	Ag. Ed. 22	Land. Gard. 17	Chem. 9	Ent. 6

As President Lewis has previously pointed out these elections probably do not represent any definite preference of the students who come here for a particular type of curriculum of studies, but rather they reflect the impressions which the students have of the economic opportunities for profitable use of the education after they have acquired it; in other words, they reflect the general idea of the student body concerning the kind of "jobs" which will be open to them upon graduation.

The former Departments of Microbiology and Veterinary Science were reorganized during the year, following the death of Dr. Marshall, Head of the Department of Microbiology. Dr. Gage was made Head of the former Department of Microbiology which was renamed the Department of Bacteriology and Physiology and planned to include some of the teaching work which Dr. Gage had been carrying on in the Department of Veterinary Science, of which he had been Head. Dr. J. B. Lentz, Assistant Professor of Veterinary Science and College Veterinarian, was named Head of the Department of Veterinary Science. I feel this is a very wise arrangement. It has provided for the consolidation of work in two departments and has permitted significant savings in personnel. The work of the new Department of Bacteriology and Physiology is still closely related to that of the Department of Veterinary Science, the two could well use much material and equipment in common. For this reason your Committee on Buildings and Arrangement of Grounds has included in the budget for special appropriation an item of $40,000 for enlarging the Paige Laboratory so that it will house both departments in one building. This arrangement will have the further advantage of liberating for other use as much needed classroom and laboratory space the present Bacteriology and Physiology building. President Lewis has already described to you plans for carrying out this new arrangement and I believe the Committee on Buildings and Arrangement of Grounds had this adjustment in mind in disposing of other building requests submitted by department heads this year.

High School Day

The 18th Annual High School Day was held at the College, Saturday, April 30. Beginning in 1908, this annual event has attracted an increasing number of high school boys and girls from a greater number of schools each year. This year the total attendance, as indicated by the number of visitors who registered, was 904, representing 126 secondary schools, as compared with 718 visitors from 105 secondary schools for the previous year. The total attendance this year was composed of 534 boys, 225 girls, and 145 teachers, principals, town representatives and others. It is estimated that 100 visitors who failed to register might be added to the total attendance figure.

High School Day has always had for its purpose the providing of an opportunity for those who are interested to inspect the College in its entirety, to meet the undergraduates and learn of their activities, to interview the faculty relative to the work of the College, and to gain an insight into the exceptional vocational advantages offered in the field of agriculture and allied sciences. The success of High School Day has been due in large measure to the splendid cooperation of the State Department of Agriculture in offering prizes in the Live Stock Judging Contests, and to the Alumni of the College, teachers and town representatives who were instrumental in organizing groups of high school students to make the trip to M. A. C.

The program this year was one which gave visitors adequate opportunity for a complete inspection of the campus. The holding of many of the contests on the preceding day permitted more time for tours of the campus on High School Day. The Live Stock Judging Contests which were held this year served as qualifying events for the three vocational school pupils who were sent as a team to represent Massachusetts at the National Dairy Show, held at Memphis, Tennessee, in October. Poultry and fruit judging contests were interesting events for the visitors and essay and short story writing contests, attempted for the first time, served to attract the attention of pupils in those high schools not usually represented in the several contests.

The detailed program and analysis of attendance for 1927 follows:

PROGRAM FOR THE DAY

8.00 A.M. Registration booths open — boys at Memorial Hall — girls at South College.
8.15 A.M. Poultry Judging Contest, Poultry Plant.
8.30 A.M.–12.00 M. Inspection of the campus and college buildings.
11.15 A.M.–12.15 P.M. College Live Stock Parade.
11.30 A.M.–1.30 P.M. Explanation of entrance requirements, Memorial Hall.
12.00 M. Luncheon — Draper Hall cafeteria open from 12.00–1.30.
12.30 P.M. Luncheon Meeting of teachers, principals, school superintendents, and town representatives, Draper Hall.
1.30 P.M. Exhibition by the Cavalry Unit — near Drill Hall.
3.00 P.M. Varsity baseball game — M. A. C. *vs.* Wesleyan, Alumni Field.
5.30 P.M. Supper — Draper Hall cafeteria open from 5.30–7.00.
7.00 P.M. Program in Stockbridge Hall. — Address by President Lewis — Award of prizes for the interscholastic championship live stock, poultry, and fruit judging contests — Entertainment by the M. A. C. Musical Clubs.
9.30 P.M. Fraternity receptions at the houses.

REGISTRATION

	1927	(1926)
Boys	534	(460)
Girls	225	(185)
Teachers and others	145	(73)
Total	904	(718)
Number of schools represented	126	(105)

CONTESTS

	No. of Teams		No. of Individuals	
	1927[1]	(1926)	1927	(1926)
Fruit Judging	16	(13)	48	(44)
Poultry Judging	15	(18)[2]	51	(58)
Live Stock Judging	12	(26)[3]	43	(78)
	43	(57)	142	(180)

Nineteen schools were represented in the essay and short story contests.

The Infirmary

Due to the death of Dr. Charles E. Marshall, the Infirmary has lost the leadership which has helped to make it of such real service to the students of the College. The direction of the Infirmary was delegated by President Lewis to Mr. Kenney and Professor Hicks. It is the purpose to continue, so far as possible, the policies inaugurated by Dr. Marshall.

During the year there were no epidemics and the general health of the student body has been very good. The outstanding cases of the year were as follows:

Infections	9
Tonsillitis	7
Grippe	9
Dysentery	4
Concussion	2
Pneumonia	1
Uremic Poisoning	1
Bronchitis	3
Scarlet Fever	1
Pleurisy	2
Measles	3

Seventy-four (74) house-patients were treated for varying lengths of time, amounting in all to three hundred and seven (307) hospital days. In addition to this number there were three hundred and twelve (312) out-patients, who made a total of five hundred and thirty-one (531) visits to the Infirmary for treatment.

Tuition Charges and College Income

I wish at this time to call your attention particularly to the considerable increase in college income during the year. We have had receipts of approximately $223,000 this year as compared with $189,000 last year, which indicated an increased revenue of $34,000. This is the first year in which the charge for tuition for students, who are residents of Massachusetts, has been operative throughout the year and it is estimated that $25,000 of this increase is attributable to this source. It is worthy of notice, however, that the college income has increased quite largely in other producing departments.

There has been opportunity during this year to observe the effect of the $60 tuition charge upon students. It is not apparent that the tuition charge has prevented any students from coming to college, although this may be the case as the present increased enrollment may not include all who would have come had there been no tuition charge. It is a fact, however, that many more students have applied for labor positions than in years previous, and that applications by students for loans have been more numerous. This seems to indicate that the new tuition charge is a real added difficulty in the way of securing an education by the type of students who come to us. I do not believe that it should be increased. Even though this is a comparatively small proportion of the total cost of a college education, it makes just that much more difficult the gaining of an education by a great many of our worthy young men and women who come from homes of the low income groups, yet who are potentially the finest possible type of material for collegiate education in a state college.

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[1] Includes no junior teams.
[2] 4 individuals entered in addition to 18 teams.
[3] 15 senior teams and 11 junior teams.

New Seed Control Law

The 1927 session of the legislature enacted a new law providing for control of sale of agricultural seeds the enforcement of which involves both the college and the State Department of Agriculture. The Department and the College have reached an agreement whereby the Department will collect samples and enforce the provisions of the law and the Experiment Station of the College will analyze and test samples and otherwise serve as a neutral fact-finding agency. The College has organized to undertake this new work on this basis by establishing a seed control laboratory and employing an experienced seed analyst to take charge of this new work. The law became effective November 1, 1927.

Supplementing this service and slightly related to it, there has developed a real need for careful supervision of the quality of legume inoculants which are distributed by the Experiment Station or offered for sale in the state by commercial laboratories and for other bacteriological testing of milk and water supplies, etc. Provision has been made in the budget for a special bacteriologist and the necessary laboratory expenses to offer this service on a cost fee basis to residents of the state.

Poultry Disease Control

The rapid development of the plan for accrediting flocks of poultry for freedom from bacillary white diarrhea has taxed the facilities of the poultry disease control laboratory to the utmost limit. Early in the year it became necessary to request a special allotment from the emergency fund for the support of this work and later a second allotment became necessary. The budget for the present year calls for an appropriation equalling in amount the total of the funds which were used to support this work for the past year; but already there are indications that this sum will be inadequate to carry the work of the laboratory this year.

Also, the pressure of this special disease control activity has made it impossible to continue the diagnostic service to live stock producers, dairy farmers and poultrymen which was formerly provided in the Veterinary Science Department. There is an active and very general demand for the renewal of this service and an item to provide the necessary pathologist and operating expenses has been included in the budget for this year. This service will be offered on a fee basis and sufficient funds collected to pay for its cost to the state.

Repairs and New Construction

The repairs to the Durfee range of greenhouses were completed at a total cost of $7,000 and these houses are now in excellent condition for use for some time to come.

The alterations and repairs of the Drill Hall for which a special appropriation of $15,000 was available were completed during the summer vacation, with the result that the space available for indoor athletics and games while still woefully inadequate for the needs is much more usable and much less dangerous to students than formerly.

A new culvert over the brook to carry steam lines was completed at a total cost of $3,036.

These minor items of repairs and new construction take care of certain features of the building equipment program presented by President Lewis in last year's report. Plans for continuing this program were approved by your Committee on Buildings and Arrangement of Grounds last June and have been embodied in the list of special items in the budget for the current year as shown in another section of this report.

Plans for the Future

Any change in administration of any institution, organization, or commonwealth always raises questions as to possible changes of policy and methods of administration. Perhaps it is for that reason that so many attempts have been made to draw from me statements of my own personal policies or plans for the future of the College. To all such attempts I have responded that it is not my right or duty to determine such plans or policies; that this is a public institution whose purposes, methods, and means of support must be matters of public concern and subject to public determination or approval.

But the frequency with which these questions are raised seems to indicate an uncertainty of public opinion as to what should be the future of this institution. Undoubtedly this uncertainty arises from at least two major causes. First, there is the general question which looms largely before the peoples of many of the states of the Union as to how the rapidly growing demands for higher education of the youth of the Commonwealth can be met. It is perfectly apparent that an ever increasing proportion of American citizens are desiring for themselves or for their children education beyond the grades of the public schools. This raises the fundamental question as to whether it is the duty of the state to provide a continually increasing opportunity for this education in democratic, publicly-supported institutions of collegiate grade, or whether such education shall be more and more turned over to colleges and universities over whose methods, aims, and ideals the public has no control. Second, there is the question of what should be the objects and ideals in the future of the "Land-Grant College" or "College of Agriculture and the Mechanic Arts" established and developed in response to the purposes of the original Morrill Act "to provide liberal and practical education of the industrial classes for the several pursuits and professions of life," when such a college exists in a highly industrialized state as Massachusetts.

While it is not my right or duty to answer these questions for this State, since you have entrusted the administration of the Massachusetts Agricultural College for the immediate future to my care I ought to have very definite opinions, aims, and hopes for its future development, and to present these from time to time to you and through you to the people of the State for approval or disapproval. Hence, I am endeavoring to prepare myself by every possible means to render this service. I am studying with care all the public documents of this Commonwealth which bear upon the past history, present scope and limitations, or future functions of this institution; also, the reports of committees from the alumni, from the combined farmers' organizations of the State, and similar groups which have examined the work of the College in the past and made recommendations concerning its future development; and finally I am reviewing as carefully and as thoroughly as I can the record of your administration of the institution in the past as presented in your Minutes and Annual Reports. Also, I am seizing every possible opportunity to discuss these matters with individuals and groups of alumni and other citizens of the State who are keenly interested in the future welfare of this institution. Further, I have already had several opportunities to discuss these same problems with some of the legislative and executive officials of the State, and have plans for more of these in the next few months.

With all these opportunities available to me, I shall hope to be able soon to contribute very definite and very real service to the solution of the problems with which we are confronted. My first year is naturally one of getting acquainted with the institution and the people of the State. May I say that I have been welcomed most cordially by everyone; that I have thus far found nothing but the friendliest spirit of cooperation from the members and friends of the institution, the alumni, and the officials of the State. I recognize that it is inevitable that differences of opinion will arise in the future; but I hope that these will be met in the same spirit of friendly cooperation and of loyalty to the best interests of the Commonwealth which exists at the present moment. I pledge to you and to the other officials of the State my very best endeavors to promote this spirit and to carry on the work of the College as the needs and wishes of the people of the State shall dictate.

Finally, I am keenly conscious of the high standing of this College among institutions of this kind, of the exceptional quality of the alumni who have received their training here and of the loyal and earnest efforts of your Board to maintain and develop these standards and quality of output. I pledge to you my very best endeavors to carry on this good work and to promote the best interests of the institution which the people of the State are entrusting to our care.

Roscoe W. Thatcher,
President.

LEGISLATIVE BUDGET FOR 1928

The following requests for appropriations for the support of this institution for the fiscal year beginning December 1, 1927, have been transmitted to the Commission on Administration and Finance for consideration in connection with the preparation of the state budget for the year.

General Maintenance

	Personal Service	Maintenance Expenses	Total
General College	$408,490	$105,410	$513,900
Experiment Station	79,200	19,000	98,200
Extension Service	58,140	36,000	94,140
Market Garden Field Station	8,000	5,000	13,000
Short Courses	62,100	11,500	73,600
Heat, light and power	–	60,000	60,000
Physical plant expenses	19,060	35,000	54,060
Fertilizer Control Law	10,500	3,000	13,500
Poultry Disease Law	11,250	3,750	15,000
Milk Testing Law	550	250	800
Commercial Feeding Stuffs Law	7,500	2,500	10,000
Seed Control Law	3,300	1,700	5,000
Laboratory Service	2,460	340	2,800
Trustee Expenses	–	1,200	1,200
Printing Reports	–	1,500	1,500
Totals	$670,550	$286,150	$956,700
Emergency	–	–	5,000
Total requests for maintenance			$961,700

Projects for Permanent Improvements

1. Dormitory, $150,000

For many years the Trustees have had before them the problem of providing adequate housing facilities for the resident students of the College. The demand for a dormitory has become increasingly pressing each year. Capacity of private houses available for student rooms is taxed to the limit and prices charged to students are high as a result. Emergency accommodations had to be provided this year to take care of students enrolling late because no available rooms could be found in town. The Trustees are again presenting this project as the most urgent in the list. It is proposed to build a dormitory which will accommodate approximately one hundred students. By charging a rental somewhat less than that charged in private houses off the campus it is estimated a return of from two to three per cent can be made to the State on this investment.

2. Enlargement of Veterinary Science Laboratory, $40,000

The recent reorganization of bacteriology, microbiology, and veterinary science has enabled us to economize in personnel and further economies in maintenance will be possible if these departments can all be housed in one building, the Veterinary Science Building. To accomplish this it is proposed to add one story to the present building at a cost estimated at $40,000. If this is accomplished, the Microbiology Laboratory will be liberated for other classroom and laboratory use, and will relieve crowded conditions in several other buildings.

3. PURCHASE OF LAND ADJOINING CAMPUS, $12,000

This proposal is to purchase a four-acre plot of land owned by the Q. T. V. corporation which adjoins the campus south of the Veterinary Science Laboratory location. The College uses this land now on a rental basis and really needs it as an acquisition to its permanent holdings.

4. FARM COTTAGE, $7,500

This project is proposed for the purpose of housing the Experiment Station Farm Supervisor and liberating the present Brooks' farmhouse which he occupies in order that the farmhouse may be used by the Department of Home Economics for a teaching laboratory. The Advisory Council of Women have pledged themselves to equip the house when it is liberated for this teaching purpose.

5. RENOVATION OF FARMHOUSE, $7,500

This is a part of the project mentioned above, that of giving the College a farm home to be used for home economics teaching purposes. This item is for repairing and renovating the present farmhouse that it will be in condition to be used for this purpose.

6. EXTENSION OF LIVING ROOM AT ABIGAIL ADAMS DORMITORY, $1,700

At the time of the construction of the Abigail Adams Dormitory, reduction in appropriation led to the reduction in size of the living room and reception hall. It has been discovered by experience that the present room is not large enough to take care of the one hundred students living in the dormitory and that serious social problems have arisen as a result. This proposal is to increase the size of the living room by removing the partitions and adding to it two adjacent study and bed rooms.

7. TILE CONSTRUCTION AT FLINT LABORATORY, $4,000

The floor and walls in the churn room of Flint Laboratory are greatly in need of repair. Modern construction requires tile walls and floors in such buildings and this estimate is based on these requirements.

8. TWO FIVE-CAR GARAGES, $5,000

At present there are no garage facilities for the farm or for the building and maintenance department with the result that the automobiles and tractors are stored in other buildings not suitable or are without any sort of garage facilities. This appropriation is required to take care of the situation.

9. REFRIGERATION SYSTEM FOR FISHER LABORATORY, $8,000

This is the storage building for fruit produced in the college orchard and is the laboratory where students of pomology do their class work. The present brine refrigeration system was installed sixteen years ago and is in such poor condition now that replacement of some sort is absolutely necessary. The installation of an automatically operated direct expansion ammonia plant is recommended. Such installation together with necessary building alterations, covered by the estimate, would make the present building modern, practical, and quite adequate for instructional and storage purposes. The proposed system will be less expensive to operate than the present cooling system. It will liberate for storage space a large section now used for ice storage and this in turn will enable the storage of apples for a better market which alone is estimated to more than pay good interest on the investment.

10. ROADS AND WALKS, $11,000

In order to provide improved roads for the main thoroughfares of the Campus and to institute permanent walks, it is proposed to build small sections of these from year to year. In 1928 it is desired to extend the macadam road started in 1923, an additional 1,800 feet from the library building to the Power Plant. This section carries the heaviest traffic which comes to the Campus and the present dirt road is entirely inadequate, especially during the seasons of frost and of heavy rain. The estimated $10,000 is for a five-inch crushed rock foundation with the three-inch bituminous bound surface.

It is also proposed to build a cement walk from South College to Olmsted Road and from the Drill Hall east to Olmsted Road a distance of approximately 600 feet costing $1,000.

11. FARM STORAGE FOR WINTER VEGETABLE CROPS, $3,000

A storage is needed which will adequately store root crops, cabbage and celery, that these crops may be saved for instruction purposes and to equalize the sales throughout the year. The storage can be constructed in such a way as to be a demonstration of a practical storage type for Massachusetts farms.

12. NEW STEAM ENGINE EQUIPMENT, $20,000

It is proposed to replace one 300 K.W. Turbo-Generator which is fast approaching the scrapping period with one 300 K.W. General Electric Alternator of similar characteristics directly connected to a four cylinder Ames Unaflow Engine and Exciter, installed complete for operation for $20,000. It is estimated that this equipment will enable an annual saving of over $7,000 and it is in addition a needed replacement.

13. REPLACEMENT OF STEAM LINE, $5,000

Some of the steam lines are more than twenty-five years old and a moderate annual replacement is quite necessary.

14. HOUSE FOR CHIEF ENGINEER, $5,000

In order to take care of the many calls for attention outside of regular hours some provision should be made for the chief engineer to live near the plant. No private dwellings seem to be available for this purpose and it, therefore, seems advisable to recommend the construction of a house to care for this situation.

15. LABORATORY FOR HORTICULTURAL INSTRUCTION, $1,100

This laboratory is needed for instruction work in horticulture. It is proposed to remodel the second floor of the present grounds service building to accommodate it.

16. ADDITIONAL LAND AT CRANBERRY FIELD STATION, $800

It is proposed to purchase certain parcels of land adjacent to the present location of the Cranberry Field Station in order to straighten out the boundary, to protect the field station from trespass, and to furnish a source of sand which is needed in the cultivation of the cranberry crop. At present there is no sand on the land owned by the station which is readily available for this purpose. It is apparent that this purchase can be made at this time and for this low figure mentioned, whereas there is some probability that it may be impossible to negotiate such a purchase for a long time in the future.

REPORT OF THE DEAN

It would be extremely difficult to report in a limited space the many matters which have to be cleared through the Dean's Office during the course of a year. Part of these are routine and seemingly unimportant. Yet they must be done regularly and sympathetically. Only in this way can the resident instruction of the college be done effectively and efficiently. Accordingly a policy of mutual helpfulness for every student in any problem, however small or large, has been adopted. Such individual work for students takes time and patience, but we feel that the results have fully justified the policy.

At the end of the first year's work under the reorganization effected just prior to my last report it is a pleasure to state that the plan is proving effective and generally satisfactory. The many demands and routine matters are being handled without confusion and unnecessary delay.

A new type of entrance certificate was drawn up and used with good results for the first time this year. In addition to the regular entrance credit certification, this certificate gives a complete transcript of the student's High School record. It also carries a set of questions dealing with the character, habits, handicaps and peculiar aptitudes of the student. The principal's answers to these questions furnish the material which is needed in advising and directing the student.

This office also took over and enlarged upon the General Information Questionnaire filled out by all freshmen. The questions asked relate to the freshman's interests and hopes, and family antecedents. Additional information on the individual student was again secured through the psychological examinations which were given to each new student during Freshman Week. This year the following tests were used:

1. The Otis Group Intelligence Scale, Advanced Examination, Form B.
2. The Army Group Examination, Alpha.
3. The American Council on Education 1927 Psychological Examination.

All this material forms the basis for the personal guidance and direction which is carried on rather intensively during the first term by a group of Freshmen Advisers. The advisory group this year consisted of the following: Dean Machmer, Assistant Dean Lanphear, Professors Serex, Skinner, Knowlton, Rand, Julian, Goding and Instructors Salman and Briggs.

The Honors Group arrangement which was started last year continues to bring favorable comment from both students and faculty. Only in a few cases have students who were granted liberal cut allowances because of high scholarship actually taken them indiscriminately. The scheme has undoubtedly encouraged scholarship and it is with satisfaction that we note its wide adoption in similar form by other institutions.

This office also undertook a study of the type of positions accepted and the initial salaries earned by graduates of this college. The study was limited to members of the classes of 1925 and 1926. The results were presented in the form of a special Dean's report.

The morale of the student body has been excellent, making the college year one particularly free from troublesome problems and serious infringements of necessary regulations.

A study is now being made of the first term Dean's Board reports for Freshmen. Student's records on these reports are compared with their complete college record. When this study is completed it should show the real significance of these reports. The results may enable us to eliminate early in the year those who are unable to carry our work successfully.

The plan of making attendance at Sunday Chapel practically voluntary is bringing about a change in attitude towards this exercise. The attendance continues satisfactory and those who attend are really interested. Student sentiment is overwhelmingly in favor of keeping this strong influence for good in our college.

The number of failures, while not very large, still presents a problem. There are too many students who are not working to capacity. This is not always due to lack of interest. Many students do not really know how to study. To remedy this condition an attempt is being made to develop better study habits. During a series of "College Life Talks" the problem is presented and directions carefully outlined. These are supplemented by the introduction of a "How to Study" text into the Freshmen orientation course taught by the Assistant Dean. Points suggested there are put into practice on the subject matter in the text book for the course called Freshman Agriculture.

Among the needs felt most keenly are (1) Freshman dormitories, (2) Additional facilities for physical education especially those which will enable us to take care of those students physically below normal, (3) A revision of the Junior-Senior curriculum which will reduce the credit requirements per term, (4) A consolidation of material in certain departments aiming at a reduction in the number of courses offered and the elimination of unnecessary duplication of material.

All these problems are now being considered either by administrative or departmental committees and helpful solutions may be expected with confidence.

William L. Machmer,
Dean.

REPORT OF THE DIRECTOR OF THE GRADUATE SCHOOL

Of greatest importance in connection with the Graduate School during the collegiate year 1926–27, was the death of its Director, Dr. Charles E. Marshall, which occurred March 20, 1927. A statement concerning his services to the institution is presented in the President's report.

In June, 1927, four students received the degree Master of Science, and one the degree Master of Landscape Architecture.

Since the last report the work of the School has followed much its usual lines. The registration from the date of the catalogue for 1926–27 to October 1, 1927, when the catalogue for 1927–28 went to press, was 111, the greatest number which has yet been recorded. This was mainly, perhaps, due to an unusual number of graduate students taking work in the Summer School, but the advantage of more advanced study is being rapidly realized everywhere and the demand for graduate study is increasing.

There are two distinct groups of graduate students: those who are working toward advanced degrees; and those who feel the necessity or desirability of further study in lines related to their various occupations but who, for one reason or another, cannot take the time necessary for degree work. So long as this latter group does not hamper or interfere with the organized work of the School leading to advanced degrees, the College, by allowing such students to take subjects offered here which they need, is giving a wider and better service to the people of Massachusetts, whose College it is, than would otherwise be the case.

One of the present needs of the Graduate School is to give the Director a more complete knowledge of what is being done by the different students. Another is to establish more definitely and to harmonize the requirements for graduate admission in different departments. A third is to fix more definitely the status of graduate assistants in relation to their duties, their assignment to departments, and to provide some means of making sure that their work shall fulfill the requirements under which they were appointed, while insuring them the time to which they are entitled for their own advancement. These needs are now being arranged for and should soon be properly met to the satisfaction of all concerned.

H. T. Fernald,
Director, Graduate School.

REPORT OF THE DIRECTOR OF SHORT COURSES

The registration for the freshman class of the Two-Year course was the largest in five years, or since the ex-service men were taking training under the Veterans' Bureau. One hundred and twenty-two men and eight women enrolled in October. Their ages range from seventeen to forty-two, and an average age of nineteen. Seventy-two seniors, sixty-four men and eight women, completed the prescribed six months' placement training and have entered upon their second year, giving a total enrollment in the course of two hundred and two.

This increase of fifty per cent in entering students over the enrollment of 1926, was quite unexpected and can be attributed to no particular changes in types of courses offered or methods of publicity. Apparently the school men of the state are becoming more familiar with the vocational opportunities of this sort of work and are directing students to it who would not otherwise be qualified for study in higher institutions of learning. Then, too, some credit must be given to the large body of Two-Year alumni graduated during the last decade, for the Two-Year course completes ten years of service this year. Many of these graduates of the Two-Year course are conducting successful agricultural enterprises in our own Commonwealth and throughout New England. An interesting evidence of our reputation outside the state is the regular enrollment of from six to a dozen students each year from Vermont.

All departments of the College with which this work is now connected appear to be well convinced of its value and use, and it seems that earlier doubts have been allayed. We shall earnestly strive to continue to justify this friendly spirit of cooperation and support.

During the year, our work, especially in the field of placement training, was closely inspected by a representative of the University of California, who spoke most favorably of the excellent plan achieved by Paul W. Viets. We were later able to be of some assistance by supplying them with catalogue material to use in effecting changes in their system of short courses.

The distinct loss sustained by this department in the resignation of Paul W. Viets, who left us this fall, should be mentioned. After seven years of successful pioneer effort, during which time he placed hundreds of Two-Year students, both graduates and undergraduates, in excellent positions, he has accepted a flattering offer as employment manager of the Plymouth Cordage Company. Fully recognizing the many difficulties attendant upon a complete carrying out of the new program proposed in vocational guidance and placement, we are confident his successor, Emory E. Grayson, M. A. C., 1917, will be able to continue and advance the work, so well started.

If this guidance program continues to develop along the lines already laid down in many colleges, it will soon be impossible for one man alone to adequately direct and supervise the personal interviews with students and carry on the placement supervision in the field, which requires a large amount of travel all over the state. The many problems pertaining to four-year placements should be carefully studied; and complete files of information explaining business opportunities will be urgently needed. All this requires constant oversight and careful use to prevent misinformation being given rather than up-to-the-minute facts.

Winter School

Again in 1926 the Ten Weeks' Winter School with attendant Ten-Day Courses in Dairying showed a disappointing registration. Forty-eight students were enrolled including sixteen in the ten-day courses. Many classes were entirely too small for efficient or economical teaching. It seemed necessary to require minimum groups this year if a class were to be organized.

After a very complete publicity program this year, there should be larger numbers in this work or it will be apparent that other agencies have met the demand and the College is no longer called upon to render this type of service on campus.

Summer School

A revised program with many new courses introduced helped to keep our registration at a normal figure with one hundred and fifty students enrolled. A marked increase in graduate students was brought about by the new courses offered in the Division of Horticulture, although some courses, tried for the first time, failed to attract. It seems desirable to recommend a continuance of these new classes.

The reorganization of the graduate school with a clearer understanding of its program and opportunities, as now effected, will aid in securing a continued growth in this department.

New Appointments and Courses

Late in the summer it became evident that our present staff in Bacteriology could not meet the increased teaching load of Two-Year classes. Ransom Packard was secured as an additional instructor.

The Military Department under Major Briscoe has been of great assistance in helping our summer school recreation program and has made it possible to develop a new course in Animal Husbandry, giving seniors practice in the care and use of riding horses.

Roland H. Verbeck,
Director of Short Courses.

REPORT OF THE DIRECTOR OF EXTENSION SERVICE

The year 1927 on the whole has been one of progress. There have been but few changes in the staff, and as the year closes all specialists positions are filled. The best indication of the character of extension work is the demand upon the time of the specialists by those whom it is designed to serve. There is an ever increasing call for the time of the specialists and a continuous endeavor on their part to adjust their work in order to distribute their efforts most effectively. This situation was pointed out in the report for the year 1926, and it is hoped that we may continue on sound programs that will prove of such value as to maintain a continuous and growing desire from farmers, home makers, and the young people, for the benefits the programs are designed to bring. The resident teachers and the experiment station staff have continued to assist the extension program, both on the campus and throughout the state.

Plans for giving active attention to the problems of distribution and marketing and home management are being realized. The specialist in agricultural economics is working out a program to bring to the attention of Massachusetts growers their competitive position in the markets to which they ship their products. It is hoped that this will lead to the production of a volume of uniform variety and quality of products conforming to standards demanded by the market. The specialist in home management is continuing permanently the work which previously has been on a temporary basis.

Continued close relations with the New England Council and the various commodity associations are bringing about greater opportunities for more effective cooperation in advancing educational endeavors. Some research work is under way which is expected to give needed information. These efforts are dependent on a continual stream of information and facts from the research workers. The value of the close relation between research and extension work is being more keenly realized by the workers in both fields as well as by those whom they serve.

Satisfactory cooperation has continued with the United States Department of Agriculture. The Department has furnished expert service, supplies, and funds from several appropriations; particularly Farmers' Cooperative Demonstration Work for the partial support of state leaders and agents in counties, Clark-McNary funds for forestry, and Biological Survey funds for rodent control.

Radio talks were broadcast from November to June, covering most of the subject matter departments, members of the resident staff as well as extension specialists facing the microphone. The letters received indicate that the use of the radio should be continued to supplement other phases of extension work.

From the standpoint of interest and effort alfalfa heads the list of projects in agronomy the past year. Increase in acreage by former growers and additions by new growers indicate a total acreage 75% larger than in 1926.

Good stands of alfalfa were secured in several sections of each county, which have thoroughly demonstrated that alfalfa can be successfully grown. In addition to the usual methods employed, the agronomic specialist prepared a series of graphic letters which were mailed by county agents to give information on alfalfa, and to get practices adopted at critical times. To further focus attention the specialist prepared articles for the extension press, using rhyme and blank verse, to tell of sound agronomic practices. Projects were carried in sweet clover production and in top dressing hay land. The 300 bushel potato club for adults was started and the junior 4-H 300 bushel potato club was continued. A lime conference was held to bring lime producers and users to a better mutual understanding.

Three dairy herd improvement associations were organized. The founding of these new associations indicates the belief of the farmers that the seven preceding ones have proved successful. The dynamometer contests at fairs have stimulated a revival of interest in the economic place of horses on the farm. Active cooperation has been continued with the Department of Conservation in the support of tuberculosis control.

Dairy extension, handled in cooperation with the New England Dairy and Food Council, opened the way to teach adequate nutrition to many families not reached in the other projects. Increased funds from private sources permitted the adding of three nutrition workers.

Farm management extension naturally is not spectacular, but service of merit was provided farmers through the giving of information relative to farm costs and farm organization practices, including analysis of cow testing (dairy accounting) records. Detailed reports of operation on 200 poultry farms furnished accurate information relative to production, mortality and costs of operation. Summaries were furnished to extension agents and through them to the farmers. Information was gathered by the survey method which shows the labor requirements and distribution for certain field and market crops in Middlesex county. Also a study was made of crop labor requirements, and combinations for different types of farming were worked out. Tours were conducted to show farmers local applications of approved methods of crop production and sound farm organization.

Farm wood lot examinations were made by the extension foresters as requests were received. 4-H club work in forestry was started in three counties. In these the first elements of forestry were begun with wood collections and tree identification. In four counties demonstration areas were started to promote the idea of proper management of wood lots, particularly along the lines of planting, thinning and pruning. Lectures were given to many audiences, but noteworthy are the talks with boy and girl scouts and camp fire girls who have included forestry as a part of their year's program. As a climax, some 800 girls visited several state forests and planted 20,000 trees in one day. The forestry extension project is handled in cooperation with the Division of Forestry, Department of Conservation, and is supported in part by the Clark-McNary funds of the United States Department of Agriculture.

Fruit growers manifested active interest in the ten-year program. Some of the outstanding achievements in the year's work were: an improved apple scab spray service for growers of McIntosh apples in Eastern Massachusetts; the focusing of attention on the high percentage of orchard run Baldwins *below* A grade, which was accomplished largely by an exhibit at the Union Agricultural Meetings at Worcester followed by a series of five circulars on "The Little Green Baldwin;" state survey of apple varieties in cooperation with four other New England states; a series of apple grading and packing schools; and a follow-up of pruning methods used in Middlesex county to check previous year's pruning. During the year a state wide list of commercial fruit growers was obtained to be used in the support of project work.

Progress continued along the three fundamental poultry projects: disease control, stock improvement through breeding, and economic production through larger units with better equipment and resulting economy of labor. Barnstable, Essex, Middlesex and Worcester counties have carried disease control campaigns. Nearly all of the commercial plants have adopted as regular practices: brooder sanitation, range rotation and disinfection of houses. During the year these practices were extended to many of the smaller poultry flocks. The wire-bottom sun porch for brooders was widely accepted this year, as it gives chicks access to direct sunshine, reduces congestion and brings relief from the constant heat of brooder stoves, and at the same time protects the chicks from worm infection. The Massachusetts Association of Certified Poultry Breeders supported the program for stock improvement through breeding, disease control and good management. Turkey production is on the increase and active contact was maintained with the Bay State Turkey Breeders Association.

Thirteen exhibits illustrating project work were held during the year. The display at the New England hardware dealers show in Boston, illustrating good orchard management practices, was awarded first prize as the best exhibit of the 150 in the hall. At eight exhibits during the fall the extension service received 2,150 requests for information and bulletins. A great many questions were asked of the staff members in attendance. Reports indicate 1,137 days were spent at 123 fairs by members of the county and college staff during the fairs of 1927. A study is under way to determine best methods of making exhibits as well as assisting the county workers in their graphic presentations.

Eleven of the correspondence courses were dropped during the year, but the enrollment has continued nearly as large; over half of the students are in poultry, next largest group being in the floriculture courses. Some of the courses are being rewritten, but enrollment is limited by funds and man power.

The past year the poultry convention was held the week before Farm and Home Week on account of the world poultry congress at Ottawa. The attendance at Farm and Home Week and the Poultry Convention was about 10% larger than the previous year.

Demonstrations (and research) at the Market Garden Field Station at Waltham continued to attract the active attention of vegetable growers. To regularly convey information to 2,000 of them the Journal of the Field Station was issued monthly during the year. The growers used about 15,000 Vita Viga labels on graded vegetables. Demonstration trials were conducted on varieties of corn, lettuce, celery, cabbage, cucumber, carrot, spinach, squash, tomato, and muskmelon. The results of these trials were summarized and distributed to growers. A noteworthy accomplishment was the widespread use of the new method to control red spiders in greenhouses. Many visitors come to the Station particularly during the growing season. Fully 900 came to the annual field day held August 4.

The Biological Survey of the United States Department of Agriculture stationed a full time specialist in rodent control at Amherst. While his territory is the whole of New England, Massachusetts has had its share in demonstrations and meetings, at which time methods for the control of animal pests were presented. Interest was shown in control of rats, field mice, and woodchucks.

In the 4-H Club Work an increased emphasis was given to the securing and training of local leaders, with the expectation that these leaders in turn will carry the teaching to their club members. To strengthen the work of these leaders training schools were held in different parts of the state; a number of these schools, as well as Camp Gilbert, being made possible by the State Department of Agriculture. New literature was written and some of the older publications were revised. In the 4-H home economics club there was an effort to emphasize the health H. In support of the dairy project work a four-page paper was issued monthly, going to dairy club members. For the handicraft project, directions and sketches for making 25 articles were prepared and distributed to agents and local leaders. Some schools were assisted in selecting equipment for their workshops. In poultry club work the outstanding achievements were improvements in egg yield and average profit, which in turn means that the club members have had better stock with which to start. Poultry contests and demonstrations were held state-wide; and a team of three Massachusetts boys won third place in the National 4-H judging contests in New York.

In the home economics extension program, one hundred thirty-nine *new* communities in the state carried some phase of home economics extension work. The communities are developing more leadership as evidenced by the increase in the number of local leaders (homemakers who have been willing to attend training schools in order to carry the instruction back to local groups) from 982 in 1925 to 1,403, a gain of 43 per cent. This is most encouraging as a strong extension program means strength within the local groups to analyze the outstanding needs of the community and to plan a constructive program which will interest all members of that community, thus developing not only pride in better homes in Massachusetts but also increased civic pride. The number of better practices adopted in the homes of Massachusetts has increased from 20,072 in 1925 to 36,160 in 1927, a gain of 80 per cent. A better balanced program has been carried throughout the state during the past year. Many of the counties put much more emphasis on the home management projects which are really basic to the other work. Much interest has been shown in the child feeding project, and, as a result, the personnel of the group has included a larger percentage of mothers of young children. Many of the counties have reported an increase in the number of rural homemakers enrolled in the projects with a greater effort to work with families rather than with individuals.

Willard A. Munson,
Director.

December 1, 1927.

REPORT OF THE DIRECTOR OF THE EXPERIMENT STATION

In presenting this, my eighth and as it happens my final, report as Director of the Massachusetts Agricultural Experiment Station, I am confining myself to a discussion of two phases of the problem of organizing this Station for effective research. These have to do respectively with external relations with those other agencies conducting agricultural research of significance to Massachusetts; and with certain problems of internal organization.

Massachusetts is a political entity situated in a region which is a part of the larger New England economic entity. It cuts across at least three separate geographic and climatic zones, each one of which in its relations to certain agricultural problems forms still another entity. It follows, therefore, that in the organization of economic research reference must be had to the problem of New England as a whole; while in the study of problems of plant and animal life there must be constant reference to zones of similar nature in adjacent states.

It is evident that the Massachusetts Agricultural Experiment Station cannot hope to formulate its research program without reference to the program of states north, south and west, nor yet without reference to the work of the Federal Government. It must give fullest service to the agricultural industry of Massachusetts, but there are conditions under which the very highest form of such service may consist in delegating to other similar institutions full responsibility for conduct of certain research studies.

Organization for effective research, therefore, is partly a problem of coordinating work with similar work in surrounding states. Few of those interested in the agricultural development of Massachusetts realize the extent to which such coordination is already an accomplished fact. A few of the significant developments of recent years are as follows:

1. The Massachusetts Experiment Station participated in a singularly successful all New England orchard survey. The Conference of Northeastern Station Directors, the New England Research Council, the United States Department of Agriculture, and the Bureau of Markets of the Massachusetts State Department of Agriculture were the agencies which made possible this cooperative study.

2. Through the services of a referee on poultry husbandry, reporting to the Conference of Northeastern Station Directors, research work on poultry is being systematized, duplication avoided, and a start made toward the concentration of men and equipment for the solution of specific problems at individual experiment stations. Massachusetts is continuing the genetic studies in which notable contributions have already been made, and for which the station has an admirable equipment; but is not undertaking studies in poultry nutrition, important though these are. Both of these problems are inherently regional or national. It has seemed better to enable one state to devote a major part of such of its resources as are available for the service of poultry husbandry to specific work of a single kind, than to dissipate resources through too large a number of individual activities.

3. The Connecticut and Massachusetts stations, working cooperatively, have divided the field of tobacco research, giving to the Connecticut Station responsibility for studies in nutrition, fertilization, and improvement by breeding; while the Massachusetts Station has taken the problem of disease control, with specific reference to those diseases which live in or are harbored by the soil. To permit effective cooperation, the two stations meet together for conference at least once annually.

4. In the New England Research Council on Marketing and Food Supply, there is now an effective agency, supported in part by the National Government, which correlates the economic studies of the experiment stations within this economic unit. This Council reports annually to the Conference of Northeastern Station Directors, although it was not organized by the Conference, nor does it have official connection with the Conference.

You will note that encouraging progress has been made in so organizing state supported research that it may be effectively coordinated with the research of other states and that conducted by the Federal Government. In this way the ends of true economy — that is, the conservation of resources for most effective use — are being attained.

With reference to internal problems of organization, one of the more important developments has had to do with the relations of technical and scientific departments. Present-day research workers in agriculture must be intensively trained in one or more sciences. The solution of most agricultural problems comes through the application of these sciences to the question at hand. Since in the organization of the Massachusetts Station there are both scientific and technical departments, the question has come up as to how to group staff members, — whether to list them as members of the technical staffs and run certain risks of lack of contact with the ideals of true science; or to place them in the scientific departments and run equally great risks of loss of contact with the industry which the Experiment Station is expected to serve.

Both methods of placing men are in use in the Experiment Station. No settled principle of organization has been developed. Of the newer members of the staff, it is probable that more have been grouped with the technical than with the science departments. In this way the services of plant physiology, plant pathology, entomology, etc., have been brought to the technical departments.

Station policy has been definitely against duplication of physical equipment. The Experiment Station Council has formulated and promulgated a policy to the effect that all laboratories and apparatus in the custody of the science departments and all fields, gardens, orchards, flocks and herds under the supervision of the technical departments should be available for study, under whatever conditions may be appropriate, to properly qualified staff members without regard to departmental affiliation.

In the above way the necessity of duplicating equipment has, in part at least, been avoided. To a degree, also, there has been value in this principle of organization in that better contact has been assured between men from the science and men from the technical departments.

In closing, I must mention one outstanding weakness in our present organization for research. In small departments, located it may be in separate buildings often at a distance from other buildings, the research force may be represented by but a single worker. It has been the experience of the past few years that the lack of day-to-day contacts with workers in other fields and of the stimulation of scientific fellowship acts as a bar to most effective work. It is difficult, however, to see how this may be avoided.

A detailed report of progress on the research projects and of the control service of the Station for the biennium will be published separately as Parts III and IV of the Sixty-sixth Annual Report of the College.

Sidney B. Haskell,
Director of the Experiment Station.

REPORT OF THE LIBRARIAN

The year has been one of quiet but steady service in the College Library. The most striking event has been the rewiring of the building during the Summer, so as to lessen the fire risk resulting from the old and imperfect wiring. The new wiring is more efficient in many ways, besides being a step toward the fireproofing which is the most urgent need of the library at the present time.

The task of getting the library in order has gone forward, and is now almost completed; the important parts of the book and pamphlet collections are now in order, and the great duplicate magazine collection is almost so. During the year 2,278 volumes have been catalogued and added to the Library, making the total of catalogued books now 79,800. There are also several thousand uncatalogued books, and many thousands of uncatalogued periodicals and pamphlets; these are, however, mostly so arranged as to be easily found.

The number of books taken out for home study has been 8,735, and of pamphlets, 1,050, January being the high month, with 1,120 books borrowed. The list of periodicals received by the Library has again been very carefully revised by the Library Committee, so as to remove unnecessary items, and the Library now receives 616 periodicals. The problem of binding the large numbers of periodicals kept for reference was for some time a very difficult one, but the binding is now being done by a good binder, the work of preparing material for binding is being efficiently handled, and the back work is well caught up. An important feature of the Library's work is the loaning of books to inquirers all over the state, and the borrowing of books from libraries at a distance for the use of research workers here; this supplements the already large book resources of the College with those of many other great collections.

The greatest need of the Library is safety from risk of fire, for the priceless collection housed in the Library building. This collection could not be reproduced at any price, and its loss could not be made up to the College. With the new wiring, and constant care, the risk is reduced, but a library ought always when possible to be housed in a building that cannot burn.

Respectfully submitted,

Basil B. Wood,
Librarian.

TREASURER'S REPORT

I herewith submit the annual report of the Treasurer for the fiscal year ending November 30, 1927.

There was an amount of $1,124,429.96 available for current expenses of the institution. Of this amount $939,345.02 was appropriated by the State Legislature and $185,084.94 was received from the United States government. We expended $1,053,974.20 leaving a balance of $70,455.76. Of this amount $43,484.78 is Government funds and $26,970.98 state funds. Of the latter amount, $24,375.63 will be brought forward on our fuel account. This leaves a balance of $2,595.35 that will be brought forward to take care of bills incurred in the last fiscal year. As our outstanding requisitions were less than $2,000.00, this amount will be ample to take care of any of the 1927 obligations.

The expenditures of the State appropriation for the institution were distributed as follows:

	Appropriation	Expenditures
College	$609,000 86	$585,221 57[1]
Experiment Station	98,298 51	97,966 02
Extension Service	84,264 58	84,571 85
Short Courses	71,664 88	70,758 30
Market Garden Field Station	12,538 13	12,524 92
Control Laws	39,633 91	37,319 03
Trustees' Travel	1,200 00	1,216 82
Printing Reports	1,500 00	2,443 68
Replacements	21,244 15	20,351 85

Of our Emergency appropriation of $5,000.00 we expended $4,181.02.

The receipts of the institution from students' fees, the sale of produce, and for services rendered under the control laws, amounted to $223,455.24 which is an increase of $34,500.00 over a year ago when the receipts were $24,000.00 in excess of the previous year. Of this increased amount, $18,000.00 was derived from collegiate fees, $6,800.00 from short courses fees, $1,200.00 from department sales, $7,000.00 from control laws, and $1,500.00 from sundry sources.

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[1] This difference is due to the large balance brought forward for the fuel appropriation.

The special appropriations for 1927 were only $38,700 and were expended as follows:

Culvert over Brook	$2,000 00
Steam line from East Experiment Station to Microbiology Building	5,000 00
Improvements at Drill Hall	15,000 00
Steam Line to Poultry Plant	1,200 00
Improvements to Durfee Range	7,000 00
Electric Wiring at Library	1,000 00
Equipment at Cranberry Station	3,000 00
Extension to Water Main on Campus — Fire Protection	2,000 00
Fire Truck for Town of Amherst	2,500 00

The summary of the inventory shows the valuation of the entire plant at $2,698,983.59. This is an increase over a year ago of approximately $47,000.00.

Our trust funds have increased to $115,486.85. This is an increase of $24,511.33 which is made up as follows:

Porter L. Newton	$23,411 33
Massachusetts Society for Promotion of Agriculture	1,000 00
Massachusetts 4-H Club for Girls	100 00

While our accounts are under the regular examination of the State Auditor's department, I will have to report that the State Auditor has made no examination of the books during the past year. This may not be as serious a matter as it might seem from the first statement, as State House, through the Comptroller's office, authorizes every expenditure. I think, however, we should have a complete audit and if this cannot be done through the auditor's office, I would suggest that an outside agency be employed.

Complete details of all expenditures and receipts follow.

Fred C. Kenney,
Treasurer.

REPORT OF THE TREASURER

For the Fiscal Year ending November 30, 1927

Balance Sheet

			Debit	Credit
1926				
Dec.	1.	To balance on hand	$42,886 05	
1927				
Nov.	30.	To departmental income	223,455 24	
Nov.	30.	To receipts from State Treasurer	732,908 27	
Nov.	30.	To receipts from United States Treasurer	136,868 08	
Nov.	30.	To bills paid by State Treasurer	230,377 91	
Nov.	30.	Expenditures for fiscal year		$1,099,555 53
Nov.	30.	Income transferred to State Treasurer		223,455 24
Nov.	30.	Balance on hand		43,484 78
			$1,366,494 55	$1,366,494 55

STATEMENT OF LEGISLATIVE APPORTIONMENT AND EXPENDITURES FOR FISCAL YEAR ENDING NOVEMBER 30, 1927 AND APPORTIONMENT REQUESTED FOR 1928

	Apportionment for Last Fiscal Year		Expenditures		Requested Apportionment for New Fiscal Year	
College:						
Personal Services	$401,414 19		$405,388 83		$426,490 00	
Maintenance	207,586 67	$609,000 86	179,832 74	$585,221 57	180,410 00	$606,900 00
Experiment Station:						
Personal Services	$79,200 00		$78,896 88		$79,200 00	
Maintenance	19,098 51	98,298 51	19,069 14	97,966 02	19,000 00	98,200 00
Extension Service:						
Personal Services	$50,264 58		$51,290 59		$58,140 00	
Maintenance	34,000 00	84,264 58	33,281 26	84,571 85	36,000 00	94,140 00
Short Courses:						
Personal Services	$60,100 00		$59,728 29		$62,100 00	
Maintenance	11,564 88	71,664 88	11,030 01	70,758 30	11,500 00	73,600 00
Market Garden Field Station:						
Personal Services	$7,500 00		$7,570 12		$8,000 00	
Maintenance	5,038 13	12,538 13	4,954 80	12,524 92	5,000 00	13,000 00
Trustees' Travel	$1,200 00		$1,216 82		$1,200 00	
Printing Reports	1,500 00		2,443 68		1,500 00	
Commercial Feedstuffs	10,013 92	12,713 92	9,886 37	13,546 87	10,000 00	12,700 00
Laboratory Service	–	–	–	–	$2,800 00	2,800 00
Fertilizer Law	$13,517 20		$13,439 28		$13,500 00	
Poultry Law	10,000 00		10,000 00		15,000 00	
Milk Testing Law	602 79		640 60		800 00	
Seed Control Law	5,500 00	29,619 99	3,352 78	27,432 66	5,000 00	34,300 00
Replacements	$21,244 15	21,244 15	$20,351 85	20,351 85	$21,060 00	21,060 00
Emergency	5,000 00	5,000 00	4,181 02	4,181 02	5,000 00	5,000 00
Totals	. . .	$944,345 02		$916,555 06		$961,700 00
Balance unexpended				27,789 96		
				$944,345 02		

CASH STATEMENT

	Other Funds	State Funds	Totals
Balance December 1, 1926	$42,886 05	–	$42,886 05
Receipts			
College receipts from students and others	–	–	59,832 81
Tuition	–	$34,852 00	–
Laboratory fees	–	6,352 45	–
Rent	–	18,628 36	–
Departmental sales	–	–	81,873 65
Products	–	70,625 87	–
Miscellaneous	–	11,247 78	–
Experiment Station	–	–	16,362 72
Cranberry receipts	–	2,931 94	–
Chemical receipts	–	398 91	–
Miscellaneous	–	13,031 87	–
Extension Service	–	–	808 21
Correspondence	–	655 60	–
Miscellaneous	–	152 61	–
Short Courses	–	–	14,234 15
Students' fees	–	14,028 15	–
Winter School	–	206 00	–
Miscellaneous	–	–	–
Market Garden Field Station	–	–	399 42
Produce	–	399 42	–
Feed Law	–	19,453 59	19,453 59

	Other Funds	State Funds	Totals
Fertilizer Law	–	$16,526 39	$16,526 39
Milk Testing Law	–	911 75	911 75
Poultry Disease Law	–	13,038 50	13,038 50
Seed Control Law	–	14 05	14 05
Treasurer of the Commonwealth	–	–	732,908 27
Maintenance	–	714,247 21	–
Special appropriations	–	13,330 25	–
Endowment	$3,313 32	–	–
Department of Education	2,017 49	–	–
Federal Government	–	–	136,868 08
Land Grant of 1862	7,300 00	–	–
Hatch Fund of 1887	15,000 00	–	–
Morrill Fund of 1890	16,666 67	–	–
Adams Fund of 1906	15,000 00	–	–
Nelson Fund of 1907	16,666 66	–	–
Smith Lever Fund of 1914	31,234 75	–	–
Purnell Fund of 1925	35,000 00	–	–
Bills paid by State Treasurer	–	230,377 91	230,377 91
	$185,084 94	$1,181,410 61	$1,366,495 55

Payments

	Other Funds	State Funds	Totals
College Expenses	–	–	$631,185 71
Personal Service	$45,964 14	$405,388 83	–
Maintenance	–	179,832 74	–
Experiment Station	–	–	163,375 80
Personal Service	58,243 06	78,896 88	–
Maintenance	7,166 72	19,069 14	–
Extension Service	–	–	114,754 53
Personal Service	29,128 37	51,290 59	–
Maintenance	1,054 31	33,281 26	–
Short Courses	–	–	70,801 86
Personal Service	–	59,728 29	–
Maintenance	43 56	11,030 01	–
Market Garden Field Station	–	–	12,524 92
Personal Service	–	7,570 12	–
Maintenance	–	4,954 80	–
Trustees' Travel	–	1,216 82	1,216 82
Printing Reports	–	2,443 68	2,443 68
Replacements	–	20,351 85	20,351 85
Commercial Feedstuffs	–	9,886 37	9,886 37
Fertilizer Law	–	13,439 28	13,439 28
Milk Testing Law	–	640 60	640 60
Poultry Disease Law	–	10,000 00	10,000 00
Seed Control Law	–	3,352 78	3,352 78
Special appropriation	–	–	43,041 97
1926 Emergency Fund	–	3,946 65	–
1926 Certain Barns	–	2,101 68	–
1927 Culvert over Brook	–	2,000 00	–
1927 Emergency Needs	–	4,181 02	–
1927 Improvements to Drill Shed	–	15,000 00	–
1927 Steam Heat at Poultry Plant	–	1,200 00	–
1927 Durfee Range Glasshouses	–	7,000 00	–
1927 Library Building Improvements	–	1,000 00	–
1927 Fire Protection at Campus	–	2,000 00	–
1927 Equipment at Cranberry Station	–	2,112 62	–
1927 Fire Truck	–	2,500 00	–

	Other Funds	State Funds	Totals
Income	–	$223,455 24	$223,455 24
Refunds to State Treasurer	–	2,539 36	2,539 36
Balance	$43,484 78	–	43,484 78
	$185,084 94	$1,181,410 61	$1,366,495 55

Budget Appropriation for Current Expenses for Year ending November 30, 1927

Personal Services:	Appropriation	Current Year	Balances
Administration	$38,615 00	$38,644 51	—$29 51
Instruction	199,680 00	198,491 90	1,188 10
Maintenance	–	–	–
Departmental	78,400 00	78,875 08	—475 08
Farm	27,000 00	28,649 76	—1,649 76
Operating	40,014 19	40,244 88	—230 69
Repairs Ordinary	17,705 00	20,482 70	—2,777 70
Replacements	1,800 00	1,814 63	—14 63
Experiment Station	79,200 00	78,896 88	303 12
Fertilizer Control Law	10,500 00	10,237 46	262 54
Poultry Disease Law	7,500 00	7,143 71	356 29
Milk Testing Inspection Law	360 00	360 00	–
Commercial Feedstuffs	7,500 00	7,656 39	—156 39
Extension Service	50,264 58	51,290 59	—1,026 01
Market Garden Field Station	7,500 00	7,570 12	—70 12
Short Courses	60,100 00	59,728 29	371 71
Seed Control Work	3,300 00	738 60	2,561 40
Total Personal Services	$629,438 77	$630,825 50	—$1,386 73
Travel	6,135 83	6,026 18	109 65
Office and other Expenses	32,469 08	32,324 86	144 22
Teaching and Laboratory Supplies	46,141 86	50,946 31	—4,804 45
Minor Equipment	6,110 51	7,219 86	—1,109 35
Experiment Station:			
Supplies and Equipment	14,068 28	15,467 66	—1,399 38
Travel	3,500 00	2,267 65	1,232 35
Office Expenses	1,530 23	1,333 83	196 40
Extension Services:			
Supplies and Equipment	15,000 00	14,468 05	531 95
Travel	19,000 00	18,813 21	186 79
Market Garden Field Station	5,038 13	4,954 80	83 33
Short Courses:			
Travel	1,500 00	1,700 08	—200 08
Office and other Expenses	10,064 88	9,329 93	734 95
Heat, Light and Power	88,215 49	63,839 86	24,375 63
Farm	15,339 57	2,783 73	12,555 84
Repairs Ordinary	13,174 33	16,691 94	—3,517 61
Replacements	19,444 15	18,537 22	906 93
Fertilizer Control Law:			
Travel	1,000 00	1,192 36	—192 36
Office and other Expenses	2,017 20	2,009 46	7 74
Poultry Disease Law:			
Travel	1,500 00	1,103 21	396 79
Office and other Expenses	1,000 00	1,753 08	—753 08
Milk Testing Inspection Law:			
Travel	215 00	168 28	46 72
Office and other Expenses	27 79	112 32	—84 53

	Appropriation	Current Year	Balances
Trustees' Expenses	$1,200 00	$1,216 82	—$16 82
Printing Reports	1,500 00	2,443 68	—943 68
Commercial Feedstuffs:			
Travel	700 00	649 58	50 42
Office and other Expenses	1,813 92	1,580 40	233 52
	$937,145 02	$909,759 86	$27,385 16
Seed Control Work:			
Travel	500 00	–	–
Office and other expense	1,700 00	2,614 18	—414 18
Total	$939,345 02	$912,374 04	$26,970 98
College Department:			
Dean's Office	$14,992 20	$14,988 56	$3 64
Executive Order	12,191 92	12,057 58	134 34
President's Office	18,334 36	18,228 52	105 84
Registrar's Office	–	–	–
Treasurer's Office	19,510 43	19,235 36	275 07
Agricultural Economics	8,567 42	8,592 96	—25 54
Agricultural Education	6,250 10	6,122 76	127 34
Agronomy	7,743 03	7,803 09	—60 06
Animal Husbandry	5,105 66	5,069 07	36 59
Beekeeping	2,260 00	2,260 00	–
Botany	13,801 93	13,384 36	417 57
Chemistry	19,552 36	19,290 42	261 94
Dairying	48,879 02	47,328 89	1,540 13
Economics and Sociology	3,650 00	3,605 48	44 52
Entomology	9,849 77	9,779 85	69 92
Farm	36,939 63	38,416 73	—1,477 10
Farm Management	6,266 21	6,246 03	20 18
Floriculture	11,291 17	11,158 27	132 90
Forestry	2,770 87	2,707 94	62 93
Freshman Agriculture	385 00	368 80	16 20
General Agriculture	5,085 00	4,765 81	319 19
General Expense	126 07	3,812 89	—3,686 82
General Horticulture	18,006 58	17,258 53	748 05
Graduate School	198 75	163 02	35 73
Grounds	10,252 55	10,416 55	—164 00
Horticultural Mfg.	6,682 54	6,651 63	30 91
Hospital	4,000 00	4,390 74	—390 74
Landscape Gardening	7,084 00	6,981 89	102 11
Language and Literature	15,020 00	14,979 98	40 02
Library	16,241 95	17,072 35	—830 40
Mathematics	5,960 00	5,958 83	1 17
Microbiology	8,343 65	8,473 40	—129 75
Military Science	2,890 86	2,866 79	24 07
Mount Toby	2,400 00	2,694 10	—294 10
Physical Education	13,169 41	13,450 27	—280 86
Physics	5,907 00	6,005 48	—98 48
Operating and Maintenance	170,218 43	147,350 57	22,867 86
Pomology	11,845 27	12,455 81	—610 54
Poultry	25,074 08	24,862 23	211 85
Rural Engineering	5,400 74	5,508 99	—108 25
Rural Home Life	12,191 21	12,628 05	—436 84
Rural Sociology	2,595 00	2,584 11	10 89
Vegetable Gardening	6,357 10	6,557 80	—200 70
Veterinary	8,845 00	8,845 85	—85

College Department — *Concluded*	Appropriation	Current Year	Balances
Women's Dormitory	$3,603 56	$4,054 92	—$451 36
Zoölogy and Geology	4,288 59	4,286 86	1 73
Salary Surplus	6,663 59	–	6,663 59
Total College Expenses	$626,782 01	$601,722 12	$25,059 89
Experiment Station Department:			
Administration	$11,196 70	$11,162 69	$34 01
Agricultural Economics	196 05	189 26	6 79
Agricultural Engineering	200 00	199 34	66
Agronomy	7,373 67	7,439 07	—65 40
Botany	8,591 05	8,627 56	—36 51
Chemistry	14,341 76	14,348 76	—7 00
Cranberry	9,325 00	8,877 24	447 76
Dairy	19 50	19 50	–
Entomology	8,080 79	7,975 13	105 66
Freight and Express	300 00	323 69	—23 69
General Horticulture	123 33	123 33	–
Horticultural Manufactures	18 00	18 00	–
Library	359 00	336 72	22 28
Market Garden Field Station	4,350 00	4,350 00	–
Meteorology	1,100 00	1,056 39	43 61
Microbiology	1,729 65	1,714 30	15 35
Pomology	6,631 00	6,554 50	76 50
Poultry	9,615 74	9,652 30	—36 56
Station Service	14,241 64	14,250 28	—8 64
Veterinary Science	2,793 00	2,790 56	2 44
Fertilizer Control Law	13,517 20	13,439 28	77 92
Poultry Disease Law	10,000 00	10,000 00	–
Milk Testing Inspection Law	602 79	640 60	—37 81
Commercial Feedstuffs	10,013 92	9,886 37	127 55
Salary Surplus	—289 37	–	—289 37
Seed Control	5,500 00	3,352 78	2,147 22
Total Experiment Station	$139,930 42	$137,327 65	$2,602 77
Extension Service Department:			
Administration	$16,459 10	$14,300 47	$2,158 63
Animal Husbandry	2,868 76	2,916 82	—48 06
Clothing	1,878 92	2,300 94	—422 02
Co-op Marketing	1,047 05	1,410 57	—363 52
Correspondence Courses	1,856 50	1,768 56	87 94
County Agents	3,515 62	3,245 62	270 00
Crop Protection	56 23	59 12	—2 89
Dairying	1,500 00	1,464 11	35 89
Exhibits	2,733 42	2,746 64	—13 22
Extension Courses at College	3,247 19	2,811 22	435 97
Farm Management	2,606 16	2,364 36	241 80
Forestry	50 00	–	50 00
Gardening	3,072 56	3,063 93	8 63
Home Demonstrations	4,508 91	4,758 17	—249 26
Horticultural Manufactures	3,666 67	3,936 36	—269 69
Household Management	1,478 16	1,926 62	—448 46
Junior Extension	13,252 52	13,154 77	97 75
Landscape Gardening	100 00	57 67	42 33
Lectures	–	26 80	—26 80
Nutrition	1,813 10	3,443 52	—630 42
Pomology	2,874 25	3,209 85	—335 60
Poultry Husbandry	3,483 13	3,436 46	46 67

Extension Service Department — *Concluded*	Appropriation	Current Year	Balances
Printing	$9,356 65	$9,297 69	$58 96
Rural Engineering	50 00	25 50	24 50
Soils and Crops	3,945 69	3,977 79	—32 10
Salary Surplus	—1,026 01	–	—1,026 01
Total Extension Service	$85,394 58	$85,703 56	—$308 98
Miscellaneous:			
Short Courses:			
Agricultural Economics	$2,170 52	$2,145 52	$25 00
Agronomy	4,493 67	4,463 25	30 42
Animal Husbandry	3,089 00	3,344 84	—255 84
Dairying	4,711 67	4,711 26	41
Entomology	100 00	88 25	11 75
Farm Management	1,660 00	1,653 23	6 77
Floriculture	2,970 15	2,944 24	25 91
Forestry	25 35	1 45	23 90
General Horticulture	2,195 04	2,137 54	57 50
Home Economics	1,582 68	1,550 80	31 88
Horticultural Mfg.	500 64	602 00	—101 36
Library	75 00	6 21	68 79
Microbiology	334 95	329 70	5 25
Office	24,508 49	24,540 33	—31 84
Physical Education	1,990 00	1,956 13	33 87
Pomology	8,339 85	8,104 30	235 55
Poultry	2,630 00	2,630 00	–
Rural Engineering	5,695 64	5,696 20	—56
Treasurer's Office	200 00	200 00	–
Vegetable Gardening	4,145 52	4,119 34	26 18
Salary Surplus	371 71	–	371 71
	$71,789 88	$71,224 59	$565 29
Market Garden Field Station	$12,748 13	$12,735 62	$12 51
Trustees' Expenses	1,200 00	1,216 82	—16 82
Printing Reports	1,500 00	2,443 68	—943 68
Total Miscellaneous	$87,238 01	$87,620 71	—$382 70
Grand Total Maintenance Appropriation	$939,345 02	$912,374 04	$26,970 98

Special Appropriations

	Appropriation	Expenditures to Date	Balance
1926 Emergency Fund	$3,946 65	$3,946 65	–
1926 Certain Barns	2,101 68	1,839 71	$261 97[1]
1927 Culvert over Brook	2,000 00	2,000 00	–[1]
1927 Emergency Needs	5,000 00	3,906 41	1,093 59
1927 Construction of Steam Line	5,000 00	–	5,000 00
1927 Improvements to Drill Shed	15,000 00	15,000 00	–[1]
1927 Durfee Glass House	7,000 00	7,000 00	–[1]
1927 Steam Heat at Poultry Plant	1,200 00	1,200 00	–[1]
1927 Library Building Improvements	1,000 00	961 16	38 84[1]
1927 Fire Protection at Campus	2,000 00	2,000 00	–
1927 Equipment at Cranberry Station	3,000 00	2,112 62	887 38
1927 Fire Truck	2,500 00	2,500 00	–
Total Special Appropriations	$49,748 33	$42,466 55	$7,281 78

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[1] Balance reverted.

COLLEGE BUILDINGS (ESTIMATED VALUE, 1927)

	Inventory at Beginning of Year	Per Cent deducted	Value at Beginning of Year less Deterioration	Repairs and Improvements during Year	Total Value at Close of Fiscal Year
Adams Hall	$120,494 77	2	$118,084 87	$749 94	$118,834 81
Apiary	2,805 16	2	2,749 06	11 27	2,760 33
Cashier's House	2,457 90	5	2,335 00	88 95	2,423 95
Chemistry Store House	46 64	2	45 71	30	46 01
Clark Hall	59,421 81	2	58,233 37	1,789 80	60,023 17
Cold Storage Laboratory	9,614 51	2	9,422 22	126 24	9,548 46
Dairy Barns and Storage	28,492 35	3	27,637 58	586 25	28,223 83
Draper Hall	74,041 43	3	71,820 19	1,416 42	73,236 61
Drill Hall and Gun Shed	8,986 79	5	8,537 45	16,532 45	25,069 90
Durfee Glass House, Old	6,446 35	5	6,124 03	8,278 75	14,402 78
Durfee Glass House, New	9,220 46	5	8,759 44	27 30	8,786 74
Farm Blacksmith Shop	381 62	3	370 17	–	370 17
Farm Bungalow No. 1	2,415 58	3	2,343 11	459 77	2,802 88
Farm Bungalow No. 2	4,166 93	3	4,041 92	10 42	4,052 34
Farm Bungalow No. 3	4,083 78	3	3,961 27	14 43	3,975 70
Farm Bungalow Garage	–	–	–	–	350 00
Farm Corn Cribs (7)	–	–	350 00	300 00	650 00
Farm House No. 1	3,290 92	3	3,192 19	431 01	3,623 20
Farm Bull Pens and Fence	3,963 26	5	3,765 10	137 14	3,902 24
Fernald Hall	67,489 36	2	66,139 57	560 91	66,700 48
Flint Laboratory	69,290 66	2	67,904 85	727 19	68,632 04
French Hall	44,652 65	2	43,759 60	623 32	44,382 92
Goessmann Laboratory	279,355 60	2	273,768 49	556 95	274,325 44
Grinnell Arena	8,525 89	2	8,355 37	71 70	8,427 07
Grounds Tool Shed	162 54	5	154 41	95	155 36
Harlow House	1,826 11	5	1,734 80	5 31	1,740 11
Horse Barn	4,459 67	3	4,325 88	453 67	4,779 55
Head of Division of Horticulture	2,855 91	5	2,713 11	285 35	2,998 46
Horticultural Barn	3,709 38	3	3,598 10	74 61	3,672 71
Horticultural Garage	1,400 10	3	1,358 10	–	1,358 10
Horticultural Tool Shed	4,903 17	3	4,756 07	–	4,756 07
Horticultural Open Shed	381 34	5	362 27	–	362 27
Horticultural Manufactures Shed	2,808 32	5	2,667 90	1 35	2,669 25
Hospital	15,729 57	2	15,414 98	407 02	15,822 00
Jewett House and Barn	2,960 82	5	2,812 78	42 57	2,855 35
Machinery Barn	3,520 20	3	3,414 59	8 03	3,422 62
Market Garden Field Station Greenhouse	13,720 00	2	13,445 60	–	13,445 60
Market Garden Field Station Office and Laboratory Building	7,840 00	2	7,683 20	–	7,683 20
Market Garden Field Station Farmhouse	5,415 00	5	5,144 25	34 93	5,179 18
Market Garden Field Station Ice House	90 25	5	85 74	–	85 74
Market Garden Field Station Large Cow Barn	8,122 50	5	7,716 37	–	7,716 37
Market Garden Field Station Small Stock Barn	1,805 00	5	1,714 75	–	1,714 75
Market Garden Field Station Small Shed	714 00	5	678 30	–	678 30
Mathematical Building	4,622 06	5	4,390 96	102 64	4,493 60
Memorial Building	97,386 97	2	95,439 23	327 46	95,766 69
Microbiology Building	53,832 78	2	52,756 12	291 21	53,047 33
Military Storage	165 85	5	157 56	–	157 56
Mount Toby House and Barn	2,969 89	5	2,821 40	–	2,821 40
North Dormitory	28,788 07	2	28,213 31	1,315 98	29,529 29
Paige Laboratory and Stable	22,963 47	2	22,504 20	187 74	22,691 94
Physics Laboratory	9,337 37	5	8,870 50	122 30	8,992 80
Piggery	2,568 56	3	2,491 50	3 56	2,495 06
Poultry departments:					
No. 1, Demonstration Building	1,947 32	2	1,908 37	345 27	2,253 64
No. 2, Oil House	147 36	2	144 41	03	144 44
No. 3, Brooder, killing and fattening laboratory	2,800 00	2	2,744 00	242 38	2,986 38
No. 4, Mechanics, storage building and incubator cellar	3,916 90	2	3,838 56	171 58	4,010 14
No. 5, Laying House	1,647 34	2	1,614 39	76 99	1,691 38
No. 6, Manure Shed	130 04	2	127 44	4 63	132 07
No. 7, Small henhouse	40 46	2	39 65	7 02	46 67
No. 8, Breeding House	1,377 51	2	1,349 96	10 69	1,360 65
No. 9, Experimental Breeding House	595 02	2	583 12	14 76	597 88
No. 10, Duck House	84 03	2	82 35	5 46	87 81
No. 11, Unit house for 200 hens	421 85	2	413 41	7 63	421 04
No. 12, Unit house for 100 hens	384 84	2	377 14	15 81	392 95
No. 13, Experimental House	–	–	–	310 02	310 02
Power Plant and storage Buildings including Coal Pocket	47,653 46	2	46,700 39	458 67	47,159 06
President's House	13,962 73	3	13,543 85	1,073 98	14,617 83

College Buildings (Estimated Value, 1927) — *Concluded*

	Inventory at Beginning of Year	Per Cent deducted	Value at Beginning of Year less Deterioration	Repairs and Improvements during Year	Total Value at Close of Fiscal Year
Rural Engineering Building	$14,270 86	2	$13,985 44	$21 99	$14,007 43
Sheep Barn	1,521 41	3	1,475 77	–	1,475 77
South Dormitory	43,017 85	2	42,157 49	1,861 08	44,018 57
Stockbridge Hall	154,991 89	2	151,892 05	1,028 49	152,920 54
Agronomy Greenhouse and Storage	4,698 09	2	4,604 13	29 74	4,633 87
Stockbridge House	1,992 95	5	1,893 30	8 05	1,901 35
Stable for Cavalry Unit	13,228 39	2	12,963 82	230 51	13,194 33
Blacksmith Shop	700 00	2	686 00	–	686 00
Storage Barn	2,800 00	2	2,744 00	76 94	2,820 94
Stone Chapel	28,596 36	2	28,024 43	1,808 07	29,832 50
Turbine House	16,692 95	2	16,359 09	60 06	16,419 15
Vegetable Plant House	4,810 49	5	4,569 97	45 59	4,615 56
Waiting Station	695 50	2	681 59	5 63	687 22
Wilder Hall	30,932 07	2	30,313 43	65 18	30,378 61
Young Stock Barns, including Isolation and Quarantine Barns	17,346 73	3	16,826 33	2,108 80	18,935 13
	$1,526,107 72	–	$1,491,770 42	$47,260 24	$1,539,380 66

Experiment Station Buildings (Estimated Value)

	Inventory at Beginning of Year	Per Cent deducted	Cost at Beginning of Year less Per Cent Deterioration	Repairs and Improvements during Year	Total Value at Close of Year
Agricultural laboratory	$13,856 61	2	$13,579 48	$67 36	$13,646 84
Agricultural barn	6,271 53	3	6,083 38	–	6,083 38
Agricultural farmhouse	1,844 73	3	1,789 39	80 80	1,870 19
Agricultural glasshouse	1,003 78	5	953 59	–	953 59
Brooks house	2,730 18	5	2,593 67	347 50	2,941 17
Brooks barn and sheds	1,224 26	5	1,163 05	–	1,163 05
Brooks tobacco barn	2,707 50	5	2,572 12	2 95	2,575 07
Cranberry buildings:					
Laboratory	6,300 00	2	6,174 00	–	6,174 00
Garage	1,142 51	2	1,119 66	168 17	1,287 83
Shed (Storage)	300 00	10	270 00	–	270 00
Pump house	165 00	5	156 75	–	156 75
Oil house	40 00	5	38 00	–	38 00
Entomological glasshouses	501 57	5	476 49	–	476 49
Plant and Animal Chemistry lab.	26,581 48	2	26,049 85	244 34	26,294 19
Plant and Animal Chemistry barns	6,260 73	3	6,072 91	268 50	6,341 41
Plant and Animal dairy	1,654 08	3	1,604 46	–	1,604 46
Six poultry houses	661 47	2	648 24	–	648 24
Tillson cottage	1,013 89	5	963 20	23 39	986 59
Tillson barn	941 85	5	894 76	–	894 76
Tillson poultry houses (4), Nos. 2, 3, 4, 5	2,780 32	2	2,734 71	–	2,734 71
Tillson Foreman's quarters and Incubator cellar No. 1	6,846 76	2	6,709 82	3 61	6,713 43
Tillson summer sheds (3), No. 6	397 20	5	377 34	–	377 34
Tillson pullet brooder No. 7	1,012 53	5	961 90	–	961 90
Tillson hen brooder No. 8	1,057 33	5	1,004 46	–	1,004 46
	$87,295 31	–	$84,991 23	$1,206 62	$86,197 85

College Equipment (Estimated Value)

Administrative division:	
Dean's Office and Schedule Room	$2,341 95
President's Office	3,307 77
Treasurer's Office	4,849 30
Agricultural division:	
Agricultural Engineering	11,187 64
Agronomy	9,529 91
Animal Husbandry	867 62
Dairy	26,545 34
Farm, including Livestock	76,634 80

Agricultural Division — *Concluded*	
Farm Management	$1,748 51
General Agriculture	2,070 12
Poultry	7,915 50
Rural Home Life	4,617 31
Dining Hall	37,949 83
Extension Service	20,508 41
General Science:	
Apiary	2,388 68
Botanical	25,964 27
Chemistry	31,776 83
Entomology	6,479 93
Mathematics	2,346 75
Bacteriology and Physiology	30,564 46
Physics	10,462 24
Veterinary	15,559 63
Zoölogy and Geology	18,335 75
Graduate School	165 25
Horticultural division:	
Floriculture	14,448 62
Forestry	460 12
General Horticulture	7,684 67
Grounds	2,638 28
Horticultural Manufactures	6,421 40
Landscape Gardening	6,828 07
Market Garden Field Station	4,573 95
Mount Toby Reservation	546 70
Pomology	7,636 65
Vegetable Garden	3,844 63
Hospital	1,009 40
Humanities division:	
Economics and Sociology	41 07
Language and Literature	731 85
Library (1926 Inventory. 1927 Inventory not filed at Treasurer's Office Dec. 30, 1927)	148,819 24
Military	2,026 03
Operating and Maintenance:	
College Supply	812 05
Fire Apparatus	1,720 55
General Maintenance:	
Office	742 58
Carpentry and Masonry Supplies	3,859 32
Carpentry and Masonry Tools	5,153 97
Electrical Supplies	3,518 70
Electrical Tools	212 46
Electrical Supplies for Commencement	533 00
Heating and Plumbing Supplies	8,268 37
Heating and Plumbing Tools	2,507 44
Painting Supplies	1,187 49
Painting Tools	234 55
Steam Main	10,701 25
Lighting Lines	10,723 64
Janitor's Supplies	1,600 76
Sewer Line	13,162 73
Water Mains	14,503 60
Power Plant:	
General Equipment	88,088 95
Tools	258 70
Supplies	254 90
Fuel	17,627 56

Physical Education	$1,650 23
Rural Social Science:	
Agricultural Economics	1,994 32
Agricultural Education	1,877 43
Rural Sociology	198 57
Short Courses	2,782 96
Textbooks	2,113 36
Social Union and Trophy Room	694 25
Women's Dormitory	9,919 60
Memorial Hall	14,823 00
Freshman Agriculture	256 42
Total	$783,811 19

EXPERIMENT STATION EQUIPMENT (ESTIMATED VALUE)

Agronomy	$598 65
Apiary	100 44
Agricultural Economics	1,010 05
Agricultural Laboratory	10,646 32
Botony	9,269 10
Cranberry Station	13,796 90
Director's Office	5,246 44
Entomological Laboratory	25,006 02
Entomology at Market Garden Field Station	276 34
Fertilizer and Feed and Seed Control	17,766 02
P and A Chemistry	19,347 07
Meteorological Observatory	541 00
Microbiology Laboratory	4,554 00
Pomology	4,635 63
Poultry	5,835 05
Treasurer's Office	855 50
Veterinary	6,074 78
Agricultural Engineering	141 50
	$125,700 81

INVENTORY — REAL ESTATE

Land (Estimated Value)

Angus Land	$800 00
Allen Place	500 00
Baker Place	2,500 00
Bangs Place	2,350 00
Brooks Farm	11,000 00
Brown Land	500 00
Charmbury Place	450 00
Clark Place	4,500 00
College Farm	37,000 00
Cranberry Land	15,500 00
George Cutler, Jr., Trustee	2,700 00
Dickinson Land	7,850 00
Harlow Farm and Orchard	3,284 63
Hawley and Brown Place	675 00
Kellogg Place	3,368 45
Loomis Place	415 00
Louisa Baker Place	5,000 00
Market Garden Field Station	21,000 00
Mount Toby demonstration forest	30,000 00
Newell Farm	2,800 00
Old Creamery Place	1,000 00

Owen Farm	$5,000 00
Pelham Quarry	500 00
Tillson Farm	2,950 00
Westcott	2,250 00
	$163,893 08

	Acres.
College estate (area)	702.19
Cranberry Station, Wareham (area)	23.67
Market Garden Field Station, Waltham (area)	55.39
Mount Toby demonstration forest (area)	755.27
Rifle Range	46.20
Pelham Quarry	.50
Total Acreage	1,583.22

SUMMARY

Land	$163,893 08
College Buildings	1,539,380 66
College Equipment	783,811 19
Experiment Station Buildings	86,197 85
Experiment Station Equipment	125,700 81
	$2,698,983 59

DINING HALL STATEMENT NOVEMBER 30, 1927

Balance December 1, 1926	$9,548 91	
Total Disbursements	126,197 95	
Outstanding bills, Nov. 30, 1927	3,643 53	
Total Collections		$132,190 48
Outstanding accounts, Nov. 30, 1927:		
Board		684 21
Special Service, etc.		132 18
Inventory, Nov. 30, 1927		8,874 76
Balance	2,491 24	
	$141,881 63	$141,881 63

BURNHAM EMERGENCY FUND

	Market Value Dec. 1, 1927	Par Value	Income
Two bonds Narragansett Company 5s @ 101	$2,020 00	$2,000 00	$50 00
One bond Jersey Central Power & Light Co. 5½s @ 102	510 00	500 00	27 50
Two bonds Power Corporation of New York 6½s @ 106	2,120 00	2,000 00	130 00
Amherst Savings Bank	500 00	500 00	–
	$5,150 00	$5,000 00	$207 50
Unexpended balance Dec. 1, 1926	–	–	56 80
American Telephone & Telegraph Co.	–	–	40 00
United States Liberty Bonds	–	–	14 33
Earnings from exchange of bonds	–	–	11 15
	–	–	$329 78
Disbursements for fiscal year ending Nov. 30, 1927	–	–	160 11
Cash on hand November 30, 1927	–	–	$169 67

LIBRARY FUND

Five bonds Lake Shore & Michigan Southern 4s @ 100	$5,000 00	$5,000 00	$200 00
Five bonds New York Central & Hudson River R.R. 4s @ 99	4,950 00	5,000 00	200 00
Two shares New York Central stock @ 161	322 00	200 00	15 00
Amherst Savings Bank deposit	175 52	175 52	8 84
	$10,447 52	$10,375 52	$423 84
Disbursements for fiscal year ending Nov. 30, 1927	–	–	$423 84

Special Funds

Endowed Labor Fund (the Gift of a Friend of the College)

	Market Value Dec. 1, 1927	Par Value	Income
Two bonds Narragansett Company 5s @ 101	$2,020 00	$2,000 00	$50 00
One bond Indiana Hydro-Electric Power Co. 6s @ 105	1,050 00	1,000 00	60 00
One bond Jersey Central Power & Light Co. 5½s @ 102	1,020 00	1,000 00	55 00
Two bonds Lake Shore & Michigan Southern 4s @ 100	2,000 00	2,000 00	80 00
One bond New York Central & Hudson River R.R. 4s @ 99	990 00	1,000 00	40 00
Amherst Savings Bank, deposit	1,143 39	1,143 39	57 84
	$8,223 39	$8,143 39	$342 84
Unexpended balance Dec. 1, 1926	–	–	451 12
American Telephone & Telegraph Co.	–	–	40 00
Earnings from exchange of bonds	–	–	11 14
	–	–	$845 10
Disbursements for fiscal year ending Nov. 30, 1927	–	–	20 00
Cash on hand November 30, 1927	–	–	$825 10

Whiting Street Scholarship Fund

One bond New York Central & Hudson River R.R. 4s @ 99	$990 00	$1,000 00	$40 00
Amherst Savings Bank deposit	771 64	771 64	39 03
	$1,761 64	$1,771 64	$79 03
Unexpended balance Dec. 1, 1926	–	–	117 05
Cash on hand November 30, 1927	–	–	$196 08

Hills Fund

One bond American Gas & Electric Company 6s	$1,080 00	$1,000 00	$60 00
One bond Narragansett Co. 5s	1,010 00	1,000 00	25 00
Boston & Albany R.R. stock 3⅝ shares @ 185	671 00	362 00	31 68
Electric Securities Corporation bonds 1 9/50 bond @ 103	1,220 00	1,180 00	59 00
One bond Great Western Power & Light Co. 5½s	1,010 00	1,000 00	55 00
One bond Monongahela West Penn Public Service 5½s	1,020 00	1,000 00	55 00
One bond New York Central 4s	980 00	1,000 00	40 00
One bond New York Central & Hudson River 4s	990 00	1,000 00	40 00
One bond Oklahoma Gas & Elec. Co. 6s	1,020 00	1,000 00	60 00
Three bonds Pacific Telephone & Telegraph Co. 5s @ 105	3,150 00	3,000 00	150 00
Amherst Savings Bank deposit	3,572 75	3,572 75	130 21
	$15,723 75	$15,114 75	$705 89
Unexpended balance Dec. 1, 1926	–	–	431 80
American Telephone & Telegraph Co.	–	–	20 00
United States Liberty Bonds	–	–	28 66
Earnings from exchange of bonds	–	–	53 05
	–	–	$1,239 40
Disbursements for fiscal year ending Nov. 30, 1927	–	–	811 02
Cash on hand November 30, 1927	–	–	$428 38

Mary Robinson Fund

Boston and Albany R.R. stock ⅜ share @ 185	$69 00	$38 00	$3 32
Electric Securities Corporation bonds 41/50 bonds @ 103	840 00	820 00	41 00
Amherst Savings Bank deposit	142 00	142 00	7 17
	$1,051 00	$1,000 00	$51 49
Unexpended balance Dec. 1, 1926	–	–	342 69
	–	–	$394 18
Disbursements for fiscal year ending Nov. 30, 1927	–	–	125 00
Cash on hand November 30, 1927	–	–	$269 18

Grinnell Prize Fund

Ten shares New York Central stock @ 161	$1,610 00	$1,000 00	$75 00
Unexpended balance Dec. 1, 1926	–	–	342 64
	$1,610 00	$1,000 00	$417 64
Disbursements for prizes	–	–	50 00
Cash on hand November 30, 1927	–	–	$367 64

Gassett Scholarship

	Market Value Dec. 1, 1927	Par Value	Income
One bond New York Central & Hudson River R.R. 4s	$990 00	$1,000 00	$40 00
Amherst Savings Bank deposit	511 64	511 64	25 86
	$1,501 64	$1,511 64	$65 86
Unexpended balance Dec. 1, 1926	–	–	119 82
Cash on hand November 30, 1927	–	–	$185 68

Massachusetts Agricultural College (Investment)

Three shares New York Central R.R. stock @ 161	$483 00	$300 00	$7 50
Unexpended balance Dec. 1, 1926	–	–	140 14
	–	–	$147 64
Disbursements	–	–	$147 64

Danforth Keyes Bangs Fund

Two bonds Narragansett Company 5s @ $101	$2,020 00	$2,000 00	$50 00
One bond Indiana Hydro-Electric Power Co. 6s	1,050 00	1,000 00	60 00
Two bonds Pacific Telephone & Telegraph Co. 5s @ $105	2,100 00	2,000 00	100 00
Two bonds Union Electric Light & Power Co. 5s @ $103	2,060 00	2,000 00	100 00
Interest from student loans	–	–	144 00
	$7,230 00	$7,000 00	$454 00
Unexpended balance Dec. 1, 1926	–	–	1,932 18
American Telephone & Telegraph Company	–	–	40 00
Earnings from exchange of bonds	–	–	11 14
	–	–	$2,437 32
Charge in connection with exchange of bonds	–	–	20 00
Total loans made to students during fiscal year $5,528.00	–	–	–
Cash received on account of student loans $4,207.00	–	–	–
Excess of loans made over accounts paid by students	–	–	1,321 00
Cash on hand November 30, 1927	–	–	$1,096 32

John C. Cutter Fund

One bond Pacific Telephone & Telegraph Co. 5s	$1,050 00	$1,000 00	$50 00
Unexpended balance Dec. 1, 1926	–	–	132 53
	$1,050 00	$1,000 00	$182 53
Disbursements for fiscal year ending Nov. 30, 1927	–	–	1 75
Cash on hand November 30, 1927	–	–	$180 78

William R. Sessions Fund

One bond Power Corporation of New York 5½s	$990 00	$1,000 00	$27 50
Five shares New York Central R.R. stock @ $161	805 00	500 00	37 50
One bond Southern Illinois Light & Power Co. 6s	1,030 00	1,000 00	60 00
Amherst Savings Bank deposit	2,500 00	2,500 00	–
	$5,325 00	$5,000 00	$125 00
Unexpended balance Dec. 1, 1926	–	–	232 66
Adirondack Power & Light Company	–	–	60 00
United States Liberty Bonds	–	–	71 63
Earnings from exchange of bonds	–	–	65 00
Power Corporation of New York (J. E.)	–	–	15 00
	–	–	$569 29
Disbursements for fiscal year ending Nov. 30, 1927	–	–	363 80
Cash on hand November 30, 1927	–	–	$205 49

Alvord Dairy Scholarship Fund

Two bonds Great Western Power Company 5½s @ $101	$2,020 00	$2,000 00	$110 00
One bond Jersey Central Power & Light Company 5½s	1,020 00	1,000 00	55 00
Amherst Savings Bank deposit	2,000 00	2,000 00	50 62
	$5,040 00	$5,000 00	$215 62
Unexpended balance Dec. 1, 1926	–	–	188 56
United States Liberty Bond	–	–	28 66
	–	–	$432 84
Disbursements for fiscal year ending Nov. 30, 1927	–	–	406 00
Cash on hand November 30, 1927	–	–	$26 84

J. D. W. French Fund

	Market Value Dec. 1, 1927	Par Value	Income
Two bonds Great Western Power Company 5½s @ $101	$2,020 00	$2,000 00	$110 00
Two bonds Jersey Central Power & Light Company 5½s @ $102	2,040 00	2,000 00	110 00
Four bonds Oklahoma Gas & Electric Company 6s @ $102	4,080 00	4,000 00	240 00
Two bonds Southern Illinois Light & Power Company 6s @ $103	2,060 00	2,000 00	120 00
Amherst Savings Bank, deposit	500 00	500 00	25 32
	$10,700 00	$10,500 00	$605 32
Unexpended balance December 1, 1926	–	–	738 47
	–	–	$1,343 79
Disbursements for fiscal year ending November 30, 1927	–	–	850 00
Cash on hand November 30, 1927	–	–	$493 79

F. G. Crane Fund

	Market Value Dec. 1, 1927	Par Value	Income
Five bonds Illinois Power & Light Corporation 6s @ $105	$5,250 00	$5,000 00	$300 00
Five bonds Jersey Central Power & Light Company 5½s @ $102	5,100 00	5,000 00	275 00
Four bonds Monongahela West Penn Public Service 5½s @ $102	4,080 00	4,000 00	220 00
Four bonds Northern New York Utilities 6s @ $105	4,200 00	4,000 00	240 00
Two bonds Power Corporation of New York 6½s @ $106	2,120 00	2,000 00	130 00
Five bonds Tide Water Power Company 5½s @ $101	5,050 00	5,000 00	275 00
Amherst Savings Bank, deposit	250 00	250 00	12 65
	$26,050 00	$25,250 00	$1,452 65
Unexpended balance Dec. 1, 1926	–	–	1,256 19
Western Power Corporation	–	–	162 50
Earnings from exchange of bonds	–	–	398 68
	–	–	$3,270 02
Cancelled notes and cash scholarships	–	–	1,365 01
Cash on hand November 30, 1927	–	–	$1,905 01

Students' Loan Fund of the Massachusetts Agricultural Club

	Market Value Dec. 1, 1927	Par Value	Income
First National Bank	$500 00	$500 00	–
Total Loans	–	460 00	–
Amount available for loan	–	$40 00	–
Unexpended balance December 1, 1926	–	–	$38 86
Interest from loans	–	–	12 50
Cash on hand November 30, 1927	–	–	$51 36

Charles A. Gleason Fund

		Market Value Dec. 1, 1927	Par Value	Income
Five bonds Prudence & Company 5½s @ $0.98		$4,900 00	$5,000 00	$275 00
Disbursements in connection with buying bond	$34 38	–	–	–
Loan	240 00	–	–	274 38
Cash on hand November 30, 1927		–	–	$0 62

Porter L. Newton Fund

	Market Value Dec. 1, 1927	Par Value	Income
Five bonds Virginia Electric & Power Company 5s @ $100	$5,000 00	$5,000 00	$250 00
Five bonds Illinois Power & Light Corporation 5½s @ $101	5,050 00	5,000 00	137 50
Eight bonds Brown Company 5½s @ $100	8,000 00	8,000 00	440 00
Five bonds Puget Sound Power & Light Company 5½s @ $103	5,150 00	5,000 00	137 50
Amherst Savings Bank, deposit	518 83	518 83	2 15
	$23,718 83	$23,518 83	$967 15
Disbursements for fiscal year ending November 30, 1927	–	–	229 19
Cash on hand November 30, 1927	–	–	$737 96

SUMMARY OF BALANCE ON HAND OF THE INCOME FROM FUNDS HELD IN TRUST BY THE M. A. C.

Burnham Emergency Fund	$169 67
Library Fund	–
Endowed Labor Fund	825 10
Whiting Street Scholarship Fund	196 08
Hills Fund	428 38
Mary Robinson Fund	269 18
Grinnell Prize Fund	367 64
Gassett Scholarship Fund	185 68
Massachusetts Agricultural College Investment Fund	–

Danforth Keyes Bangs Fund	$1,096 32
John C. Cutter Fund	180 78
William R. Sessions Fund	205 49
Alvord Dairy Scholarship Fund	26 84
J. D. W. French Fund	493 79
F. G. Crane Fund	1,905 01
Students' Loan Fund of the Massachusetts Agricultural Club	51 36
Charles A. Gleason Fund	62
Porter L. Newton Fund	737 96
	$7,139 90

I hereby certify that I have this day examined the Massachusetts Agricultural College Account, as reported by the Treasurer, Fred C. Kenney, for the year ending November 30, 1927. All bonds and investments are as represented in the Treasurer's report. All disbursements are properly vouched for, and all cash balances are found to be correct.

Frank Gerrett,
Auditor.

History of Special Funds

Burnham Emergency Fund. — A bequest of $5,000 from T. O. H. P. Burnham of Boston made without any conditions. The Trustees of the College have used this fund in any cases of emergency where funds were not available. At present the fund is intact and the income only has been used for such emergency matters as the Trustees have authorized. The fund now shows an investment of $5,000.00.

Library Fund. — The library of the college at the present time contains 79,800 volumes. The income from the fund raised by the alumni and others is devoted to its increase, and additions are made from time to time as the needs of the different departments require. December 27, 1883, William Knowlton gave $2,000.00; January 1, 1894, Charles L. Flint gave $1,000; in 1887, Elizur Smith of Lee, Mass., gave $1,315. These were the largest bequests and now amount to $10,375.52.

Endowed Labor Fund. — Gift of a friend of the college in 1901, income of which is to be used for the assistance of needy and deserving students, $5,000.00.

Whiting Street Scholarship Fund. — Gift of Whiting Street of Northampton, for no special purpose, but to be invested and the income used. This fund is now used exclusively for scholarships, $1,000.00.

Hills Fund. — Gift of Leonard M. and Henry F. Hills of Amherst, Mass., in 1867, to establish and maintain a botanic garden, $10,000.00.

Mary Robinson Fund. — Gift of Miss Mary Robinson of Medfield, in 1874, for scholarship, $1,000.00.

Grinnell Prize Fund. — Gift of Hon. Wm. Claflin, to be known as the Grinnell agricultural prize, to be given to the two members of the graduating class who may pass the best oral and written examination in theory and practice of agriculture, given in honor of George B. Grinnell of New York, $1,000.00.

Gassett Scholarship Fund. — Gift of Henry Gassett of Boston, the income to be used for scholarship, $1,000.00.

Massachusetts Agricultural College Investment Fund. — Investment made by vote of trustees in 1893 to purchase one share of New York Central and Hudson River Railroad stock. The income from this fund has been allowed to accumulate, $100.00.

Danforth Keyes Bangs Fund. — Gift of Louisa A. Baker of Amherst, Mass., April 14, 1909, the income thereof to be used annually in aiding poor, industrious, and deserving students to obtain an education in said college, $6,000.00.

John C. Cutter Fund. — Gift of Dr. John C. Cutter of Worcester, Mass., an alumnus of the college, who died in August, 1909, to be invested by the trustees and the income to be annually used for the purchase of books on hygiene, $1,000.00.

Alvord Dairy Scholarship Fund. — Gift of Henry E. Alvord, who was the first instructor in military tactics, 1869–71, and a professor of agriculture, 1885–87, at this institution. The income of this fund is to be applied to the support of any worthy student of said college, graduate or postgraduate, who may be making a specialty of the study of the dairy husbandry (broadly considered) with the intention of becoming an investigator, teacher, or special practitioner in connection with the dairy industry, provided that no benefits arising from such fund shall at any time be applied to any person who then uses tobacco in any form or fermented or spirituous beverages, or is known to have done so within one year next preceding, $4,000.00.

William R. Sessions Fund. — In accordance with the request of my deceased wife, Clara Markham Sessions, made in her last will, I bequeath to the trustees of the Massachusetts Agricultural College, Amherst, Mass., the sum of $5,000, it being the amount received by me from the estate of the said Clara Markham Sessions. The said $5,000 to be kept by the said trustees a perpetual fund, the income from which shall be for the use of the Massachusetts Agricultural College; and according to the further request of my deceased wife, made in her last will, this is to be known as the William R. Sessions Fund, and is to be a memorial of William R. Sessions; and it is my special request that the said trustees shall make record of the fact that this fund came from the estate of my deceased wife, Clara Markham Sessions, in accordance with her request made in her last will, $5,000.00.

J. D. W. French. — Gift of the Bay State Agricultural Society of Boston, Mass. This fund to be known as the J. D. W. French Fund, and the Trustees of the Massachusetts Agricultural College are to use the income of this fund where it will do the greatest good, in the interest of Dairying and its allies, also in Forestry, as scholarships, loans, or prizes; especially, however, to help pay the expenses of the judging teams to the National Dairy Show and to the National Livestock Shows, $10,000.00.

Frederick G. Crane Fund. — Gift of Frederick G. Crane of Dalton, Mass. The income of this fund is to be expended by the Trustees of the Massachusetts Agricultural College in aid of worthy undergraduate students of limited financial resources at the college, preference being given to residents of Berkshire County; such payments are to be known as the Frederick G. Crane Scholarship, $25,000.00.

Massachusetts Agricultural College Fund. — The Massachusetts Agricultural Club gave $500 to be used as a scholarship loan fund to the Massachusetts Agricultural College to help out deserving students there, who intended seriously to go into agriculture, interest on loans not to be charged until after graduation, $500.00.

Charles A. Gleason Fund. — The gift of Charles A. Gleason of North Brookfield, Mass., a trustee of the college from 1889 to his death, September 29, 1925. "A clean record of noble deeds." This fund is to be used as the Trustees of the College shall direct, $5,000.00.

Porter L. Newton Educational Fund. — This is for the purpose of establishing a fund to be known as the Porter L. Newton Educational Fund, the income of which is to be used by the administrative officers of the Massachusetts Agricultural College, by means of scholarships for the education of such citizens of the United States as said Trustees may deem worthy and deserving of the same, such education to be along agricultural lines, it being my intention by this gift to do something which may tend to improve the general agricultural situation in Massachusetts.

Mr. Newton's original intention was that as far as possible this money should be used to help young men obtain this sort of an education, particularly those young men who reside in Middlesex County, $23,411.33.

Four-H Club Loan Fund for Boys. — Given by the Massachusetts Society for the Promotion of Agriculture to be used as a loan fund to help worthy boys, especially those formerly members of 4-H clubs, to obtain a general education at the Massachusetts Agricultural College. Such loans are to be made according to the general business practice, with interest, and all notes to mature within two years after graduation, $1,000.00.

Four-H Club Loan Fund for Girls. — It is the wish of the administrative officers of the Massachusetts 4-H Club for girls that this fund be increased largely by future donations. The first contribution is from Mrs. J. J. Storrow of Boston, Mass., $100.00. This is to be used as a loan fund for girls desiring a general education at the Massachusetts Agricultural College and is to be loaned on the same basis as the 4-H Club loan fund for boys, $100.00.

Total of special funds, $115,486.85.

Fred C. Kenney,
Treasurer.

STATISTICS

Table I. — New Appointments

A. In the Academic Departments

Instructor in English: Paul B. Anderson, B.A., University of Minnesota, 1925; M.A., Harvard, 1927.
Stenographer, Library: Elizabeth M. Boguslawski.
Instructor in Physical Education: Laurence E. Briggs, B.S., Massachusetts Agricultural College.
Stenographer, Departments of Poultry Husbandry and Agricultural Engineering: Della E. Brownell.
Bookkeeper, Treasurer's Office: Anna E. Bukoski.
Stenographer, Department of Botany: Dorcas Candlin, B.S., Simmons, 1927.
Instructor in Horticultural Manufactures: Calton O. Cartwright, B.Voc.Agric., Massachusetts Agricultural College.
Assistant Professor of Landscape Gardening: Clarence C. Combs, B.S., University of Missouri, 1916; M.L.A., Harvard, 1927.
Stenographer, Department of Poultry Husbandry: Loretta L. Cook, B.S., Tufts, 1926.
Telephone Operator: Kenzie G. Davidson.
Instructor in French: Delmont T. Dunbar, A.B., Bowdoin, 1921.
Instructor in French: Stowell C. Goding, A.B., Dartmouth, 1925; A.M., Harvard, 1927.
Stenographer, President's Office: Mrs. Sally R. Hilyard.
Instructor in Chemistry: Wilbie S. Hinegardner, B.A., Bridgewater College, 1922; M.A., University of Virginia, 1923; Ph.D., Yale, 1927.
Stenographer, President's Office: Esther H. Hubbard.
Stenographer, Department of Agricultural Education: Mary R. Knightly.
Stenographer, Farm Department: Mrs. Helen G. Mitchell.
Stenographer, Department of Bacteriology: Mrs. Kathleen Powers.
Instructor in Entomology: Kenneth A. Salman, B.S., Massachusetts Agricultural College, 1924.
Stenographer, Division of Horticulture: Helen Shea.
Stenographer, Department of Dairying and Animal Husbandry: Elizabeth L. Streeter.
President: Roscoe W. Thatcher, B.S., University of Nebraska, 1898; M.A., 1901; D.Agr., 1920; LL.D., Hobart College, 1925.
Stenographer, Division of Horticulture: Marion A. Woodbury.

B. In the Experiment Station

Assistant Research Professor of Home Economics: Esther S. Davies, Ph.B., Wooster College, 1907; B.S., Simmons, 1913.
Laboratory Assistant Department of Agricultural Economics: Virginia R. Dufresne, A.B., Mt. Holyoke, 1925.
Investigator in Horticultural Manufactures: Francis P. Griffiths, B.S., University of Washington, 1927.
Investigator in Cranberry Studies: Joseph L. Kelley.
Investigator in Farm Management: Ronald L. Mighell, B.S., Iowa State College, 1925; M.S., University of Minnesota, 1926.
Investigator in Chemistry: Paul R. Nelson, B.S., Massachusetts Agricultural College, 1925.

Technical Assistant in Home Economics; Elsie E. Nickerson, B.S., Massachusetts Agricultural College, 1926.
Investigator in Agronomy: Moses E. Snell.

C. *In the Control Service*

Analyst: Miriam K. Clarke, A.B., Mt. Holyoke, 1920.
Assistant Official Chemist: H. Robert DeRose, B.S., Kansas State College, 1927; M.S., 1927.
Specialist, Poultry Disease Elimination: William R. Hinshaw, D.V.M., Michigan State College, 1923; M.S., Kansas State College, 1926.
Analyst, Seed Control: Elizabeth F. Hopkins, A.B., Vassar, 1920; M.S., Massachusetts Agricultural College, 1927.
Analyst: John W. Kuzmeski, B.S., Massachusetts Agricultural College, 1927.
Assistant Specialist, Poultry Disease Elimination: Ellmore F. Sanders, D.V.M., Kansas State College, 1927.

D. *In the Extension Service*

Stenographer: Alma J. Bridgman.
Stenographer: Agnes Brownell.
Assistant Specialist in Home Economics: Esther B. Cooley, B.S., Montana State College, 1916.
Specialist in Home Management: Mrs. Harriet J. Haynes, B.S., Columbia, 1914.
State Leader of Home Demonstration Agents: Mrs. Annette T. Herr, B.S., Columbia, 1920; A.M., 1923.
Stenographer: Dorothy I. Packard.
Specialist in Marketing: Harold B. Rowe, B.S., Iowa State College, 1923.
Clerk: Sam W. Truesdell.

E. *In the Short Courses*

Supervisor of Placement Training: Emory E. Grayson, B.S., Massachusetts Agricultural College, 1917.
Instructor in Dairying: Harry G. Lindquist, B.S., Massachusetts Agricultural College, 1922; M.S., University of Maryland, 1924.
Instructor in Horticulture: Carroll A. Towne, B.S., Massachusetts Agricultural College, 1923.

TABLE II. — SPEAKERS FOR THE YEAR

A. *Speakers at Assembly for the Year ending Nov. 30, 1927*

1926	
Dec. 2.	Student Forum.
Dec. 9.	Sir Ramsey Muir, London.
1927	
Jan. 5.	Mr. Samuel T. Dana, Amherst, Mass.
Jan. 12.	Rev. James Dexter Taylor, Amherst.
Jan. 19.	Professor J. W. Crook, Amherst College.
Jan. 26.	Mr. Robert Frost, Amherst College.
Feb. 2.	Mr. J. B. Weis, Holyoke.
Feb. 9.	Mr. Harry A. Gardner, Boston.
Feb. 16.	Mr. Fred S. Cooley, Sunderland.
Feb. 23.	Student Forum.
Mar. 2.	Rev. Henry Lincoln Bailey, Longmeadow, Mass.
Mar. 9.	Mr. Charles Warburton, Northampton.
Mar. 30.	Mr. John H. Geldart, Y. M. C. A. Foreign Secretary.
Apr. 6.	Rev. Arthur Lee Kinsolving, Amherst.
Apr. 13.	Sir Herbert Ames, Montreal.
Sept. 22.	Mr. Robert G. Foster, Washington, D. C.
Sept. 29.	Professor Frank P. Rand, M. A. C.
Oct. 6.	Professor Laurence R. Grose, M. A. C.
Oct. 13.	President Roscoe W. Thatcher, M. A. C.

1927
Oct. 20. Professor Herbert Friedman, Amherst College.
Oct. 27. Mr. Leonid Tulpa, Boston, Mass.
Nov. 3. Col. Henry S. Graves, New Haven, Conn.
Nov. 10. Student Forum.
Nov. 17. Mr. George F. E. Story, Worcester, Mass.

B. Speakers at Sunday Chapel for Year ending Nov. 30, 1927

1926
Dec. 5. Dr. Nehemiah Boynton, Newton Centre.
Dec. 12. Bishop Thomas F. Davies, Springfield.
1927
Jan. 9. Principal Alfred E. Stearns, Andover.
Jan. 16. Dean Charles R. Brown, Yale University, New Haven, Conn.
Jan. 23. Rev. J. H. Nolan, Springfield.
Jan. 30. Bishop Edwin H. Hughes, Chicago, Ill.
Feb. 6. Rev. Kenneth C. MacArthur, Cambridge, Mass.
Feb. 13. Rev. William Horace Day, Bridgeport, Conn.
Feb. 20. Bishop William F. Anderson, Malden, Mass.
Feb. 27. Rev. Harry P. Nichols, New York City.
Mar. 6. Mr. Albert E. Roberts, New York City.
Mar. 13. Dr. D. Brewer Eddy, Boston.
Apr. 3. Mr. Joseph H. Twichell, Williams College, Williamstown.
Apr. 10. President Paul D. Moody, Middlebury College, Middlebury, Vt.
Apr. 24. Rev. Charles A. Wing, Springfield.
May 1. Rev. Samuel A. Eliot, Boston.
Nov. 6. President Bernard I. Bell, St. Stephen's College, Annandale, N. Y.
Nov. 13. Bishop John T. Dallas, Concord, N. H.
Nov. 20. President J. Edgar Park, Wheaton College, Norton.

TABLE III. — ATTENDANCE

	REGISTRATION NOV. 1, 1926			REGISTRATION NOV. 1, 1927		
	Men	Women	Total	Men	Women	Total
A. In the Work of College Grade						
Graduate Students	33	6	39	34	6	40
Senior Class	77	10	87	95	21	116
Junior Class	89	21	110	84	25	109
Sophomore Class	115	30	145	115	31	146
Freshman Class	150	35	185	143	43	186
Special Students	4	–	4	3	–	3
Totals	468	102	570	474	126	600
B. Short Course Enrollment						
Two-year Course, second year	69	9	78	65	8	73
Two-year Course, first year	78	9	87	125	8	133
Vocational Poultry Course	6	–	6	4	–	4
Totals	153	18	171	194	16	210
C. Other Short Course Enrollment						
Winter School	58	10	68	47	2	49
Summer School	51	116	167	53	96	149
Totals	109	126	235	100	98	198

D. Convention Registration

	1926	1927
Annual Extension Service Conference	100	115
New England Greenkeepers' Club	–	30
Polish Farmers' Day	225	250
4-H Canning and Garden Leaders' Conference	–	30
Massachusetts Park Association	–	35

	1926	1927
Massachusetts Cemetery Association	–	68
Lawn Day	26	45
Lime Dealers' Conference	–	40
4-H Leaders' Canning School	–	57
Camp Gilbert (4-H Club Winners)	110	150
Farm and Home Week and Poultry Convention	3,500	3,800
Field Day, Market Garden Field Station	–	895
Extension Home Economics Conference	–	30
High School Day	718	900
English Folk Dance School	–	150
University Extension Industrial Institute	58	50
School for Veterinarians	70	–
Middlesex County Club Champions	80	75
Fertilizer Dealers and Manufacturers	75	–
New England Association of Chemistry Teachers	–	50
Hampshire County League of Churches	–	150
Men's Club, Hope Church, Springfield	–	50
Connecticut Valley Section of American Chemical Society	–	70
Rural Ministers' School	–	15
Cosmopolitan Clubs of Massachusetts-Connecticut Valley Colleges	–	40
International Students Educational Group	–	30
	4,962	7,125

TABLE IV. — STATISTICS OF FRESHMEN ENTERING MASSACHUSETTS AGRICULTURAL COLLEGE, SEPTEMBER, 1927

A. *Home Addresses of Students (classified by Towns and Cities)*

Abington	1
ALBANY, N. Y.	1
Amherst	10
Arlington	3
Ashby	1
Ashfield	1
Athol	3
ATTLEBORO	1
Barnstable	1
Belchertown	1
Belmont	1
Berlin	1
Billerica	1
Blackstone	2
BOSTON	8
Bridgewater	1
Brimfield	2
BROCKTON	2
Brookfield	1
BROOKLYN, N. Y.	1
CAMBRIDGE	1
Camden, Me.	1
Caribou, Me.	1
Cohasset	1
Conway	1
Dracut	1
Easthampton	1
East Longmeadow	1
FITCHBURG	1
Framingham	1
Franklin	2
Gorham, Me.	1
Grand Falls, Newfoundland	1
Greenfield	3
Hadley	1
Hatfield	1
HAVERHILL	1
Hingham	1
Holden	1
HOLYOKE	7
Lee	3
Leicester	1
LEOMINSTER	2
Leverett	1
Littleton	1
Longmeadow	2
LOWELL	2
LYNN	1
MALDEN	1
Manchester	1
Maynard	1
MEDFORD	3
MELROSE	3
Methuen	1
Millbury	1
Natick	1
NEW BEDFORD	2
NEW BRUNSWICK, N. J.	1
New Salem	1
NEWTON	2
NEW YORK CITY	1
NORTH ADAMS	3
North Attleborough	1
Northborough	1
Northbridge	2
North Brookfield	2
Northfield	1
NORTHAMPTON	7
North Reading	1
Otis	1
Palmer	1
PARIS, France	1
Petersham	1
Port Leyden, N. Y.	1
Plympton	1
Pownell, Vt.	1
PROVIDENCE, R. I.	1
REVERE	1
Richmond	1
Sarnia, Ontario, Can.	1
Saugus	2
Scituate	2
Sharon	1
Sheffield	1
Shelburne	3
Shelton, Ct.	1
Shrewsbury	1
Shutesbury	1
SOMERVILLE	1
Southbridge	1
South Hadley	2
SPRINGFIELD	6
Stockbridge	1
TAUNTON	1
Townsend	1
Upton	1
Walpole	1
WALTHAM	2
Wareham	1
Watertown	4
Wellesley	1
West Bridgewater	1
WESTFIELD	5
Westminster	1
WHITE PLAINS, N. Y.	1
Williamsburg	1
Windsor, Ct.	1
WORCESTER	8

B. *Home Addresses (classified by States and Countries)*

	Number	Per Cent		Number	Per Cent
Connecticut	2	1.07	New Jersey	1	.54
Canada	1	.54	New York	5	2.68
France	1	.54	Rhode Island	1	.54
Maine	3	1.61	Vermont	1	.54
Massachusetts	170	91.39			
Newfoundland	1	.54		186	99.99

C. *Home Addresses (classified by Counties of Massachusetts)*

	Number	Per Cent		Number	Per Cent
Barnstable	1	.59	Middlesex	33	19.40
Berkshire	10	5.88	Norfolk	6	3.54
Bristol	5	2.95	Plymouth	10	5.88
Essex	6	3.54	Suffolk	9	5.29
Franklin	12	7.05	Worcester	31	18.23
Hampden	24	14.11			
Hampshire	23	13.52		170	99.98

D. *Nativity of Parents*

	Number	Per Cent
Neither parent foreign born	122	65.59
Both parents foreign born	34	18.27
Father (only) foreign born	8	4.30
Mother (only) foreign born	22	11.83
	186	99.99

E. *Education of Father*

	Number	Per Cent
Common School	69	37.09
High School	55	29.57
Business School	18	9.68
College or University	32	17.20
Self-educated	2	1.07
No statistics	10	5.38
	186	99.99

F. *Occupation of Father*

	Number	Per Cent
Agriculture and Horticulture	28	15.05
Artisans	56	30.10
Business	46	24.73
Professional	22	11.83
Miscellaneous	18	9.68
No statistics	16	8.60
	186	99.99

G. *Intended Vocations of Students*

	Men	Women	Total	Per Cent
1. *Farming*, including Market Gardening, Nursery business, Florist's business, Fruit Growing, Management of Estates, General Farming, Poultry Husbandry, Livestock Breeding, etc.	30	3	33	17.73
2. *Agricultural Business*, including sales of agricultural products and other capacities in such as the fertilizer industry, the feed industry, etc.	1	–	1	.54
3. *Science*, including Chemistry, Botany, Entomology, Bacteriology, etc., in such capacities as research experts, laboratory assistants, technologists, etc.	32	11	43	23.12
4. Landscape Architects and Agricultural Engineers	23	5	28	15.03
5. *Teachers*, including College Professors, High School Instructors, Specialists in Extension Education, etc.	7	8	15	8.07
6. *Professional Practiticners*, including Physicians, Surgeons, Dentists, Lawyers, Veterinarians, Ministers, etc.	2	–	2	1.07
7. Civil Engineers	1	–	1	.54
8. *Industrial Enterprises*, including Manufacturing, Merchandising, Advertising, Banking, Accounting, Real Estate, Insurance, etc.	1	–	1	.54
9. Authors, Artists, Journalists, etc.	1	2	3	1.62
10. Miscellaneous	4	7	11	5.91
11. Undecided	41	7	48	25.81
	143	43	186	99.98

H. *Farm Experience*

	Men	Women	Total	Per Cent
Brought up on a farm	31	13	44	23.65
Not brought up on a farm and having no or practically no farm experience	67	29	96	51.61
Not brought up on a farm but having had some farm experience	45	1	46	24.73
	143	43	186	99.99

I. *Miscellaneous Statistics*

Average age (years)	18.58

MASSACHUSETTS AGRICULTURAL COLLEGE

THE SIX WEEKS' SUMMER SCHOOL

JULY 5—AUGUST 17

1928

THE M. A. C. BULLETIN

Amherst, Mass.

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No. 1859.

FACULTY

Roscoe W. Thatcher, D.Agr., LL.D., *President of the College.*
Roland H. Verbeck, B.S., *Director of Short Courses.*
Robert D. Hawley, B.S., *Secretary of the College.*
Fred C. Kenney, *Treasurer of the College.*
Basil B. Wood, A.B., *Librarian.*
Mrs. Maud Marshall, *Matron of Women's Dormitory.*

Charles P. Alexander, Ph.D., *Assistant Professor of Entomology.*

Kathleen E. Bennett, *Assistant Professor of Home Economics,* Montana State College, Bozeman, Mont.

Harold D. Boutelle, B.S., Ch.E., *Instructor in Mathematics.*

William H. Davis, Ph.D., *Assistant Professor of Botany.*

Leigh C. Douglass, Ed.M., *Professor of Education and Psychology,* Grinnell College, Grinnell, Ia.

Henry T. Fernald, Ph.D., *Professor of Entomology, Head of Department, Director of the Graduate School.*

Helen G. Fish, *Instructor,* Metropolitan Museum of Art, New York, N. Y.

Harry N. Glick, Ph.D., *Professor of Agricultural Education.*

Clarence E. Gordon, Ph.D., *Professor of Zoology and Geology, Head of Department, Head of Division of Science.*

Arthur K. Harrison, *Assistant Professor of Landscape Gardening.*

Franklin E. Heald, A.M., *Agent for Agricultural Teacher-Training in State Department of Education.*

Wilbie S. Hinegardner, Ph.D., *Instructor in Chemistry.*

W. L. Matthews, A.M., *Superintendent of Schools,* Franklin, Ky.

A. Vincent Osmun, M.S., *Professor of Botany and Head of Department.*

Ransom C. Packard, B.S.A., *Instructor in Bacteriology.*

Charles H. Patterson, A.M., *Professor of English, Head of Department of Languages and Literature.*

Walter E. Prince, A.M., *Assistant Professor of English.*

Clark L. Thayer, B.S., *Professor of Floriculture, Head of Department.*

Charles H. Thompson, M.S., *Professor of Horticulture.*

Bertha Titsworth, *Head of Home Economics Department,* Ohio Wesleyan University, Delaware, Ohio.

Marion L. Tucker, A.M., *Assistant Professor of Home Economics.*

Frank A. Waugh, M.S., *Professor of Landscape Gardening, Head of Department, Head of Division of Horticulture.*

FACULTY COMMITTEES

Committee on Admission.

Dean William L. Machmer.
Director Roland H. Verbeck.
Dr. Henry T. Fernald.

Course of Study.

Dean William L. Machmer.
Director Roland H. Verbeck.
Dr. Henry T. Fernald.
Professor Ralph A. Van Meter.
Professor Winthrop S. Welles.

GENERAL ANNOUNCEMENT

The twenty-first session of the summer school at the Massachusetts Agricultural College will begin July 5 and continue until August 17 inclusive. Only graduate and undergraduate work will be offered.

Admission. — There are no formal examinations for admission to the summer session. Students, both men and women, will be admitted to such courses as their preparation allows.

Purpose. — The summer school program is arranged for:

1. School superintendents and teachers connected with high schools, normal schools, colleges and universities who seek advanced instruction either with or without relation to an academic degree.
2. College students who desire to further their regular college work.
3. Teachers who desire to pursue courses that will better prepare them for their work.
4. Any serious student who finds courses suited to his preparation and needs.

Registration. — Registration will be held in the Memorial Hall from 9 A.M. to 5 P.M. on Thursday, July 5. Late registrations should be made at the Short Course Office, South College. (Telephone 424.)

Classes will begin promptly at 8 A.M. Friday, July 6, and will be held as announced in the description of courses until Wednesday, August 15, inclusive. Examinations will be held on Thursday and Friday, August 16 and 17.

Registration of Graduate Students. — (Summer Session.) Graduate students not candidates for an advanced degree at the Massachusetts Agricultural College must submit evidence of their graduation but are nor required to file transcripts of their past training. All such should consult the Director of the Graduate School and secure his consent before registering for any courses. Such students may obtain, upon request to the Director, an official statement of the work completed in the Summer Session.

Graduate students desiring credit toward an advanced degree at the Massachusetts Agricultural College must meet the requirements of the Graduate School at the time of their first registration, as follows:

Admission. — Admission to the Graduate School will be granted:

1. To graduates of the Massachusetts Agricultural College.
2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of accepted standing, but has not taken as much of the subject as he desires to select for his major study, as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work in that department as the head of the department may consider necessary, without credit toward his advanced degree.

Admission to the Graduate School does not necessarily admit to candidacy for an advanced degree, students holding a bachelor's degree being in some cases permitted to take graduate work without becoming candidates for higher degrees.

Applications for membership in the Graduate School should be presented to the Director of the School, accompanied by an official transcript of the applicant's undergraduate, and any graduate work he may have had, and by a statement whether the applicant desired to work for a degree.

Registration is required of all students taking graduate courses, the registration card being obtained through the Director of the Graduate School.

Fees. — There are no tuition or laboratory fees for students registered in the Graduate School.

Graduates Studies. — Some graduate work is available during any term of the year; in the summer quarter, however, special arrangements must be made with the head of the department in which the student plans to take work, except in the case of courses offered in this circular.

Change of Program. — Notice of any proposed addition or cancellation of courses after registration must be reported at once in person at the office of the

Director of the Summer Session. Students will be allowed after securing the consent of the Director to make such additions or cancellations up to and including July 9. After July 9 they will be permitted to make no changes whatever. A student attending any course is required to do the full work assigned to the class.

Credits. — All courses are measured in terms of credit units. A credit is earned by carrying a course that meets two hours a week throughout a term of six weeks. As a rule two hours of laboratory work are considered the equivalent of one hour of lecture or recitation. The total amount of collegiate credit which may be earned cannot exceed 10 term credits.

Recreation. — The Summer Session offers many advantages. Amherst is a quiet college town located in the beautiful Connecticut Valley. The living conditions are excellent and especially desirable for students who wish to spend a part of the summer in study in restful surroundings.

The social life of the Summer School is attractive. There are many attractive places, groves, brooks, woods, picnic grounds near Amherst easily accessible.

The annual Farm and Home Week held under the direction of the College Extension Service in July brings hundreds of people to the campus for the four-day program. This year the dates are July 24 to July 27, inclusive. A fine program of lectures, with many speakers of national prominence, gives summer school students an unusual opportunity during this session. No extra fees. Plan to have your friends visit the college at that time.

A DELIGHTFUL RECREATION OPEN TO SUMMER-SCHOOL STUDENTS

Golf. — Amherst has a fine nine-hole course and privileges are extended t summer school students at a special rate for the six weeks.

Riding. — The College has excellent facilities for horseback riding. Saddl horses are available through the courtesy of the Military Department and instruction is given by United States Army officers.

Tennis. — There are many fine tennis courts available for summer schoo students.

Informals. — At regular intervals through the session informal social gatherings will be held in the Memorial Building.

A reception to all summer school students will be held in the Memorial Buildin Friday evening, July 6. Secure tickets at Short Course Office for all summe school social affairs at time of registration.

Expenses. — There is a tuition charge of $10 to residents of Massachusetts Those students not residents of Massachusetts must pay a tuition fee of $30 for th summer session. Special fees; recreation $2.00 (for all students); auditor's fee, $2.00.

The total estimated expense for the summer session need not exceed one hundred dollars ($100.00) itemized as follows: Board for six weeks, $45.00; room rent six weeks, $18.00; books, $5.00; laboratory fees, $5.00; tuition, $10.00; laundry, $6.00; incidentals, $10.00.

Rooms (Women). — The women's dormitory is available for women students. There are thirty double and thirty-eight single rooms. A uniform rate of $3.00 per week will be charged each student. *Each one will be required to supply her own blankets, sheets, pillow cases, etc.* Convenient arrangements for laundry work may be made in Amherst. *Students taking rooms in the dormitory must conform to dormitory regulations.* Observance of these regulations is one of the conditions under which the rooms are rented and failure to comply with the regulations will mean a surrender of the room and a forfeiture of the amount paid. A student whose conduct is not satisfactory may be asked to withdraw from the dormitory.

All requests for dormitory rooms must be made to the Treasurer of the college. A deposit of $3 is required in order to secure a reservation in the dormitory. Students will be notified by the Treasurer, upon receipt of the fees, as to the location of the room. In case any change is desired, the request should be made immediately. Deposits will not be refunded after the beginning of the summer session. The deposit is applied to total payment for the room at registration.

Rooms (Men). — Comfortable rooms can be secured at moderate prices in private homes as follows:

Single room $3.00–$4.00 per week; double rooms or suites for two persons $2.50–$3.00 per person; board $7.00 per week and up. A list of rooms available in the village will be furnished to summer school students at the time of registration.

Board. — The college maintains a cafeteria on the self-service plan in Draper Hall, on the college grounds. Board may be had at from $6.00 to $8.00 per week. Good boarding places can also be secured outside of the college if desired.

Laboratory Fees:

Clothing	$1.00
Foods	4.00
Cryptogamic Botany	2.00
55. Garden Flowers and Bedding Plants	1.50
80. Physiological Chemistry	4.00
191. Garden Design	2.50
194. Surveying and Mapping	2.50

Assemblies. — A student assembly is held once a week on Tuesday, from 1.00 to 1.50 P.M. At this assembly the notices of the summer session are given, reports of social and other committees made and other business of interest to the student body is transacted.

Rules and Regulations. — As a guide to those who come to the College for the first time, the following extracts are taken from the regular rules of the College:

The customary high standard of college men and women in honor, manliness, self-respect, and consideration for the rights of others constitutes the standard of student deportment.

It should be understood that the College, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend but also to name conditions under which students may remain in the institution.

It is the custom of the College that all socials should first have the approval of some recognized College authority.

The College. — The College campus occupies an attractive site three-quarters of a mile north of Amherst center. It is connected with the town and the railway station by electric car service. The College has over 700 acres of land, most of which is in a high state of cultivation, and illustrates most of the leading agricultural industries of Massachusetts. There is a large range of greenhouses of the most modern and approved type; there is a modern dairy barn with a large herd of pure-bred cattle; there are good horses, pure-bred swine, sheep, and poultry; there are fields of corn, potatoes, clover, and grass in season; orchards of apple, peach, plum, and pear trees; tracts of good forest land, nurseries, and market gardens. There are also considerable tracts devoted to experiments, many of which are of unusual interest. Then there are well-equipped departments of botany, entomology, and chemistry, dealing in the most thorough manner with these special sciences. The advantages of the plant, equipment, and teaching staff are made available to Summer School students.

Libraries. — The College Library occupies the entire building formerly partly occupied by the chapel. It contains more than 73,000 bound volumes and a very large collection of pamphlets, probably twice as numerous, which are of great practical value, being monographs on the technical subjects studied in the College. These pamphlets include particularly the publications of the United States Department of Agriculture and those of the State Experiment Stations of other Agricultural colleges in this country and abroad. Among the bound volumes, works on agriculture, horticulture, botany, entomology and the various sciences, connected especially with agriculture predominate, but literature, history, economics, religion, sociology and art are also well represented. More than six hundred periodicals covering technical and general subjects, and including the best farm papers are regularly taken and both the current numbers and the back files are readily accessible.

The Library is open for readers from 8 A.M. to 10 P.M. during term time and during part of Sunday. Vacation hours are somewhat shorter.

The excellent facilities of the Converse Memorial Library of Amherst College are courteously extended to members of the Massachusetts Agricultural College Summer School. Hours 9.00 to 12.00 A.M. during the summer.

The town of Amherst in its Jones Memorial Library, just completing a new $250,000 building, offers further additional advantages of unusual excellence.

Volumes in all three libraries number nearly 235,000.

Railroad Connections. — Boston and Maine Railroad trains run direct to Amherst from Boston. Connections also may be made, Boston to Greenfield, with bus service to Amherst.

The Boston and Albany Railroad affords a quicker route, changing at Palmer for the Central Vermont Railroad stopping at Amherst, or going through to Springfield for transfer. Here change to Boston and Maine for Northampton, and take trolley there to Amherst. Or trolley may be taken directly from Springfield for Holyoke, changing to Amherst trolley at Holyoke. A very picturesque ride up the valley, passing Mt. Holyoke College at South Hadley.

SUMMER SCHOOL COURSES

EDUCATION

The courses indicated here are intended primarily for those who are engaged in teaching or who are preparing to teach. Some of them are of value as general courses for those not having this particular objective. Opportunity is offered for both undergraduate and graduate work. Our experience indicates that these opportunities are especially appreciated by students who are pursuing work toward a degree. Through the co-operation of the State Department of Education the College is able to offer special advantages in training in the field of secondary school teaching and vocational teaching. In this co-operation R. O. Small, Director of Vocational Education; F. W. Morse, Supervisor of Secondary Education; R. W. Stimson, Supervisor of Agricultural Education, and possibly others will participate.

Education courses numbered 52, 56, 75, 79, and 93, if carried with additional work involving a thesis, may be taken for graduate credit, provided prerequisites in Education have been satisfied, and the work is rated at 80 or above. Those numbered in the hundreds are special and accepted for graduate credit.

51. Principles and Methods of Teaching. — Consists of a study of general principles of teaching and school management applied to particular "cases" taken from actual experience in public school work. Discussions of rational solutions of these "cases" tend to fix the ideas in method. Certain assigned and optional readings are required. These are both technical and inspirational in character and cover the best there is printed on the subject of methods of teaching. They are supported by sharp class discussions of the main issues. Exercises in teaching under supervision are also required with criticism and discussion of methods and results. A basic text is used. 10 class hours. Credit 5. *Professor Matthews.* 10.00–11.50, M.T.W.T.F., Room 111, Stockbridge Hall.

52. History of the Philosophy and Practice in Education. — A study of the development of philosophical ideas and movements and their relation to educational theory and practice. The relation between the fundamental aspects of the history of education and the significant factors in the history of civilization is stressed. 10 class hours. Credit 5. *Professor Glick.* 8.00–9.50 M.T.W.T.F., Room 102, Stockbridge Hall.

55. Introduction to Psychology. — (Offered in Summer School of 1929.) A study of the fundamental principles of Psychology both from the standpoint of method and content. Constant attempts are made to explain human behavior both mental and physical in the light of the principles studied. It is a basic course for those anticipating further study in psychology as well as a practical cultural course for those who can take but one course in this field. 10 class hours. Credit 5.

56. Educational Psychology. — An application of the principles of psychology to the problems of education. Emphasis is placed upon (1) Original nature — its cause and meaning for education; (2) Individual differences — their nature, cause, measurement and significance; (3) Learning — its nature, kinds, most economical methods, etc.; (4) Transfer of training — its amount and significance; (5) Measurement of achievement — educational tests, new type examinations, distribution of marks. 10 class hours. Credit 5. *Professor Douglass.* 10.00–11.50 M.T.W.T.F., Room 102, Stockbridge Hall.

75. Secondary Education. — This course has two main objectives: (1) To aid high school teachers and principals in gaining a valuable perspective of the aims and functions of secondary education and to give them a near view of the details by which these are realized. (2) To present administrative phases of secondary education that are involved in curricula, schedules, extra curricular activities, relations with other organized forms of education, etc. Inglis' "Principles of Secondary Education" or its equivalent is used as a text. 6 class hours. Credit 3. *Professor Matthews.* 3.00–4.50 M.W.F., Room 102, Stockbridge Hall.

76. Special Methods in Teaching Vocational Agriculture. — The work consists of outlining lessons and projects for the teaching of agriculture or related subjects in agricultural schools or departments; the application of principles of vocational education as embodied in the Smith-Hughes Act and state legislation relative to agricultural education; the necessary adjustments relating to the school, community and administrative officials. (Students electing this course should not elect Course 103.) Undergraduates must secure the consent of Professor Welles before enrolling. 10 class hours. Credit 5. *Mr. Heald.* 8.00–9.50 M.T.W.T.F., Room 317, Stockbridge Hall.

79. Tests and Measurements. — A critical study is made of the development, theory, use, application, etc., of the various types of mental tests and measurements with emphasis upon their function in the schools. Practice is given in the administration and scoring of tests. Modern statistical methods are applied to the interpretation of results. 4 class hours. 2 laboratory hours. Credit 3. *Professor Glick.* 1.00–2.50 M.W.F., Room 102, Stockbridge Hall.

93. Experimental Psychology. — Demonstrations are made of the apparatus and methods of experimental psychology. Experiments are performed by members of the class. Statistical treatment is applied to the experimental data. The objective of the course is to develop scientific observation of human behavior. 6 class hours. Credit 3. *Professor Douglass.* 3.00–4.50 M.W.F., Room 316, Stockbridge Hall.

95. Modern Trend in Educational Philosophy. — (Offered in Summer School of 1929.) A general survey of present philosophical theories and tendencies with special emphasis upon their significance in determining present educational objectives and practices. Credit 3.

103. The Employed Teacher of Agriculture. — For employed teachers and directors of vocational agriculture. Prospective candidates may be admitted by special arrangement. The course deals with problems which grow out of the experiences of Massachusetts teachers of vocational agriculture; methods and technique of teaching agriculture. Constructive assignments bearing upon the individual experiences and prospects of the members of the class are merged with the campaigns under way for better teaching in agricultural schools. No student should elect both Special Methods (Course 76) and this course during the same term.

It is desirable that, by previous correspondence, a plan may be developed with reference to individual problems and the instructor will recommend some definite data relating to the problem to be secured before the summer school opens. 10 class hours. Credit 5. *Mr. Heald.* 8.00–9.50 M.T.W.T.F., Room 317, Stockbridge Hall.

104. Vocational Education. — A study of the laws, rulings and policies in Federal and State supported vocational education in the United States. The philosophy and experiences leading to the legislation and the evolution of a well defined body of practice especially in Massachusetts since 1906. The types of work involved, the occupations represented, the administration and supervisory problems, standards set, approval factors, machinery necessary and dangers to be avoided. Day schools, part-time and continuation schools, evening schools. Relation to other secondary education. While leaning toward the agricultural field this course avoids the specific phase treated in the "Methods" courses. Mr. R. O. Small, Director of Vocational Education, and Mr. R. W. Stimson, Supervisor of Agricultural Education, each give one week of service in this course. Brief correspondence in advance addressed to the instructor in charge will enable the student to secure maximum values from the course. 6 class hours. Credit 3. *Mr. Heald.* 10.00–10.50 M.W., 10.00–11.50 Tu.Th., Room 317, Stockbridge Hall.

HOME ECONOMICS

Clothing (Rural Home Life 28). — Emphasis will be placed on clothing selection, and on design, color and becomingness to the individual. Practice will be given in making simple garments, for the students in the class or for children, using mainly cotton and linen materials. Laboratory made garments will be compared with ready made with emphasis on the quality of material. 1 lecture hour and 1 two-hour laboratory period daily. Credit 5. *Miss Tucker.* 1.00–3.50 M.W.Th. F., 2.00–4.50 Tu., Room 212, Stockbridge Hall.

Foods (Equivalent to Rural Home Life 50). — Principles of cookery with the meal as a working basis. The course gives the fundamental principles of selection and preparation of food. Emphasis is placed on the development of recipes from foundation formulæ and on the consideration of food costs in relation to the home budget. 1 lecture hour and 1 two-hour laboratory period daily. Credit 5. *Miss Bennett.* 9.00–11.50 M.T.W.T.F., Room A, Fernald Hall.

Home Furnishing (Equivalent to Rural Home Life 61). — This course aims to develop good judgment and right standards in the selection and arrangement of home furnishings. There will be discussions of color combinations, good spacing, also the treatment of floors, walls, and woodwork, and practical problems in the choice and arrangement of furnishing from an economic and artistic standpoint. Field trips will supplement class work. 1 lecture hour and 1 two-hour laboratory period daily. Credit 5. *Mrs. Fish.* 9.00–11.50 M.T.W.T.F., Room 316, Stockbridge Hall.

Teaching Home Economics. — This course will discuss modern educational principles as applied to teaching Home Economics especially in Junior and Senior high schools. Courses of study, lesson plans, equipment, text-books, and illustrative material will be considered. Of especial value for those who wish to keep abreast of the times and to know about recent trends in Home Economics. 1 lecture and 1 two-hour laboratory period daily. Credit 5. *Miss Titsworth.* 8.00–8.50, 3.00–4.50 M.T.W.T.F., Room 111, Stockbridge Hall.

SCIENCE AND ALLIED COURSES

Insect Life. — (Equivalent to Entomology 26.) An introduction to the study of Entomology. The lectures consider the relationships of insects, their general morphology and metamorphosis, principles of control, and a detailed consideration of the more interesting and important species. In all cases the discussion is illustrated by actual specimens. The field work emphasizes the points brought out in the lectures and gives the student a first-hand knowledge of the haunts and habits of many species of insects. Students making collections will be given opportunity to mount and preserve the material secured, and aid in the identification of such specimens will be given by the instructor. Equipment, as nets, killing bottles, boxes and insect pins may be obtained from the college at cost price. 5 lectures per week; a field trip on Saturday afternoons. Credit 3. *Professor Alexander.* 2.00–2.50 M.T.W.T.F., Room K, Fernald Hall.

Advanced Entomology. — (Entomology 52.) Studies on how to recognize and classify insects in the various groups, paying particular attention to those which are used in grade school and high school work or are of economic importance. 4 two-hour laboratory periods per week. Credit 2. *Professor Fernald.* 10.00–11.50 M.Tu.Thu.F., Room H, Fernald Hall.

60. Public Health. — This course will treat the following subjects: the human body in health and disease; individual, family and social elements; agencies of disease — nutrition, and food including milk, food poisoning and infection, air and ventilation, water and water supplies, sewage and sewage disposal, avenues of infection, susceptibility and resistance; communicable diseases, isolation and disinfection; public control; health laws and organization.

This course is designed to meet the needs of public school superintendents, principals, and teachers. 5 class hours. Credit 3. *Mr. Packard.* 8.00–8.50 M.T.W. T.F., Room 28, Microbiology Building.

Botany for the Teacher. — This course is intended primarily for secondary school teachers of botany, biology, general science, nature study and elementary agriculture. Principles of teaching, methods, model lessons, course content and subject matter are some of the things considered. Collecting and identifying weeds, grasses, trees, shrubs and common "wild flowers" are a feature of the course. 4 two-hour and 2 one-hour periods per week. Credit 3. *Dr. Davis.* 8.00–9.50 M.Tu.Th. F., 9.00–9.50 W., 1.00–1.50 Th., Room B, Clark Hall.

Fresh Water Algæ, Fungi, Liverworts, Mosses and Ferns. — (Equivalent to Botany 26.) Types of spore plants or Cryptogams are studied in this course, especial attention being given to their morphology, life-histories and environmental habits. These plants compose one of the most interesting and important groups of the Plant Kingdom. They are not so generally familiar as the flowering plants, however, and because of this it is believed that teachers of botany and biology, as well as others, may wish to embrace the opportunity offered by this course to study them. The region in and about Amherst is unusually rich in cryptogamic flora, especially the ferns, and hence the conditions for field study and collecting are ideal. Clark Hall, wholly devoted to the work of the Department of Botany, provides unexcelled laboratory facilities. 2 lectures and 4 two-hour laboratory periods per week. Credit 4. *Professor Osmun.* 9.00–9.50 Tu.Th., Room A, Clark Hall. 10.00–11.50 M.T.W.T., Room C, Clark Hall.

80. Physiological and Food Chemistry. Open to those who have had elementary chemistry. Designed to acquaint the student with the chemistry of the physiological processes in plants and animals. The study of food, its digestion and utilization by the human body is the principal subject. The physiology and functions of the principal organs of the body, the effects of abnormal functioning and recent advances in correcting the same, are discussed. In the laboratory experiments are conducted with food materials and with the processes and products of digestion, secretion and excretion.

The course, while of general interest, should appeal especially to those in home economics, dietetics, chemistry, public health, botany and animal husbandry. 5 lecture hours and 2 four-hour laboratory periods per week. Credit 5. *Dr. Hinegardner.* 8.00–8.50 M.T.W.T.F., Room 26, Goessmann Laboratory. 1.00–4.50 M.F., Room 107, Goessmann Laboratory.

Plant Materials. — (Equivalent to Horticulture 52.) Especially hardy trees and shrubs used in general landscape planting; their identification, propagation, culture and use in landscape gardening. The collection on the college grounds offers excellent opportunity for such summer study. 6 lecture hours per week.

Credit 3. *Professor Thompson.* 8.00–8.50 M.Tu.Th.F., 3.00–4.50 W., Room F, French Hall.

Garden Flowers and Bedding Plants. — (Floriculture 55.) Will cover the general field of out-door floriculture, especially as practiced in connection with floriculture and landscape gardening. The propagation, culture, and uses of perennials, annuals, and bedding plants will be studied with ample work in the college garden. 5 lecture hours and 1 afternoon per week. Credit 3. *Professor Thayer.* 9.00–9.50 M.T.W.T.F., Room C, French Hall. 2.00–3.50 M., Room B, French Hall.

Geologic Processes and the Origin of Land Forms. — (Equivalent to Geology 50.) Offered to teachers and others as an introduction to the work of various agents in shaping the surfaces of the land. The physiography of today will be viewed as part of the panorama of changing landscapes of the past. The story will be presented as a moving picture in which the whole world is the stage and the actors are the wind, the rain and running water and the forces that slumber within the earth. The Connecticut Valley offers unusual advantages for studies of geologic processes and the history of land forms. The class work will consist of lectures, practical exercises on maps, and field excursions, in such sequence as will best serve the purpose of the course. The student will have access to mineral and rock collections, topographic and geologic maps and numerous publications. 5 one-hour and 5 two-hour periods per week. Credit 5. *Professor Gordon.* 9.00–11.50 M.T.W.T.F., Room B, Fernald Hall.

The Connecticut Valley at the latitude of Amherst; view looking west. Part of the campus of the Massachusetts Agricultural College in the foreground. The skyline in the distance represents an uplifted ancient erosion surface, or peneplain. During and after uplift of the region running water and the agents of the weather produced a wide-open valley along a belt of yielding rocks. In late glacial times a lake occupied the region and the clays and silts laid down in this lake now form the flat and fertile fields dotted with tobacco barns. The picture is taken from the western slope of a drumloid hill of material laid down by the advancing ice-sheet.

Animals and Plants of the Past. — (Equivalent to Geology 51.) This course discusses the succession of plants and animals on the earth and from the records in the rocks tries to restore the scenes as they shift from age to age. Principal emphasis is placed upon changes in animal life. An elementary knowledge of biology is assumed. 3 one-hour and 3 two-hour periods per week. Credit 3. *Professor Gordon.* 2.00–4.50 M.W.F., Room B, Fernald Hall.

Mathematics I. College Algebra. — This course will cover the usual topics included in an Advanced Algebra course and will be accepted as satisfying the first term course in Freshman Mathematics at this college. Topics included: quadratic equations, the progressions, variation, binomial theorem, undertermined coefficients, permutations and combinations, logarithms, determinants, theory of equations and series. 6 class hours. Credit 3. *Mr. Boutelle.* 9.00–10.50 M., 9.00–9.50 T.W.T.F., Room B, Mathematics Building.

(**Preparatory Algebra.** — For students not registered in the Summer School, or who may be planning to enter college in the fall, opportunity is provided to secure tutoring instruction. Further information will be supplied by writing to the Director of Short Courses.)

55. American Literature. — In this course an attempt will be made to show how American life and the changing character of American institutions and ideals are mirrored in the works of its most significant writers. The student may become acquainted with the men themselves, may investigate the forces that shaped them and made their contribution what it is. He will come to understand specific works and appreciate them. The writers considered will be Irving, Cooper, Hawthorne, Poe, Emerson, Lowell, Whitman, Howells, Clemens. The work can be adapted considerably to fit the needs of the group that may elect the course. 5 class hours. Credit 3. *Professor Prince.* 9.00–9.50 M.T.W.T.F., Room 111, Stockbridge Hall.

Dramatic Presentation. — (Credits accepted as a substitute English course by arrangement.) Professor Patterson's course in Dramatic Presentation has been given to large classes since the beginning of the Summer School. Professor Patterson is a pupil of M. T. Brown, S. S. Curry, Otis Skinner, George Riddle, and others. He made a special study of the stage at the Comedie Francaise, Paris, where he was a pupil of Georges Berr. For some years he was on the professional stage with the Boston Museum Company, Maude Banks, Margaret Mather, and Otis Skinner. Mr. Patterson is known as a reader especially of Shakespeare's plays and Rip Van Winkle. He has given courses at West Virginia University, Boston School of Expression, and elsewhere.

The cultural value of dramatics to the individual and to the rural community is very great. Amateur plays are too often conceived as mere shows or social relaxation, and are produced in absolute ignorance of stage values, effective stage directions, proper play selection, character casting, and interpretation. Play production can be made both an art and a school for the rural community.

The course is practical. The members of the class are rehearsed in several plays. A few of the best plays are presented before the school. These presentations have attracted large audiences every year. The needs of teachers who produce plays in our schools are specially considered. 2 lectures and 4 two-hour practice periods a week. Credit 3. *Professor Patterson.* 3.00–4.50 M.T.W.T.F., Auditorium, Stockbridge Hall.

SPECIAL PROGRAM

of

GRADUATE AND UNDERGRADUATE COURSES IN HORTICULTURE

The Summer School of 1928 presents a special program of courses in Horticulture and Landscape Gardening.

Admission. — The courses are designed to meet the needs of recent graduates who wish to undertake intensive study in various lines of Horticulture and Landscape Gardening. Those having bachelor's degrees will register in the Graduate School and may receive credit toward advanced degrees. A limited number of qualified undergraduate students will also be admitted, registering in the Summer School and receiving credits which may be counted toward the bachelor's degree. Students registering thus in the undergraduate school will be required to bring evidence that they are in good standing in some institution of college grade.

Program of Courses. — The following program of courses will be offered. The College reserves the right to withdraw courses for which fewer than five registrations are received.

191. Garden Design. — Special study wlll be given to the principles of sound design as applied to smaller garden problems. Emphasis will be placed upon the ideas characteristic of American home gardens of the present time. Good local examples will be studied in the light of these principles. Problems in design will be given, adjusted as far as possible to the preparation of individual students. 5 lecture hours and 1 two-hour laboratory period per week. Credit 3. *Professor Waugh.* 11.00–11.50 M.T.W.T.F., 2.00–3.50 F., Room A, Wilder Hall.

194. Surveying and Mapping. — Will be studied with special reference to their application in the general practice of landscape architecture. The work will be adjusted to the preparation of individual students. 4 lecture hours and 2 two-hour laboratory periods per week. Credit 3. *Professor Harrison.* 10.00–10.50 M.Tu.Th.F., 2.00–3.50 Tu.Th., Room A, Wilder Hall.

Plant Materials. — (Equivalent to Horticulture 52.) Especially hardy trees and shrubs used in general landscape planting; their identification, propagation, culture and use in landscape gardening. The collection on the college grounds offers excellent opportunity for such summer study. 6 lecture hours per week. Credit 3. *Professor Thompson.* 8.00–8.50 M.Tu.Th.F., 3.00–4.50 W., Room F., French Hall.

Garden Flowers and Bedding Plants. — (Floriculture 55.) Will cover the general field of out-door floriculture, especially as practiced in connection with floriculture and landscape gardening. The propagation, culture, and uses of perennials, annuals, and bedding plants will be studied with ample work in the college garden. 5 lecture hours and 1 afternoon per week. Credit 3. *Professor Thayer.* 9.00–9.50 M.T.W.T.F., Room C, French Hall. 2.00–3.50 M., Room B, French Hall.

Note: Special work in various departments may be arranged for qualified graduate students. It is possible that some such arrangement may be made outside the departments listed above. This opportunity for individual work is considered an essential feature of the general plan, and will be developed as fully as the needs and abilities of students may justify.

SHORT COURSES AT MASSACHUSETTS AGRICULTURAL COLLEGE

TWO-YEAR COURSE IN PRACTICAL AGRICULTURE

The Two-Year Course is divided into seven sections — dairying, animal husbandry, poultry, floriculture, horticulture, pomology, and vegetable gardening.

No examinations are required. Minimum age seventeen years; minimum schooling eighth grade.

The first year consists of six months' study at the College and six months of required farm placement training, under the supervision of the College. During the placement period the student is expected to learn much of the practical side of his particular vocation. He is recommended to a position. These positions are on farms, in dairies, greenhouses, poultry plants. The nature of the position depends on the student's particular interest.

The second year consists of nine months' study at the College. On the completion of the course a certificate is granted. Tuition is $20.00 per term to residents of the Commonwealth. Term begins October 1, 1928.

ONE-YEAR VOCATIONAL POULTRY COURSE

This course is limited to 12 students. It begins January 1 of each year. Students are required to do a large amount of practical work at the College plant. It provides excellent training for the man who wishes to go into poultry as a business.

TEN WEEKS WINTER SCHOOL

The dates of this school are approximately from January 1 to March 10. The following subjects are offered:

Agronomy
Types and Breeds
Livestock Feeding
Animal Breeding
Animal Diseases
Poultry Husbandry
Vegetable Gardening
Floriculture
Horticulture

Farm Management
Botany
Entomology
Sanitation and Hygiene
Farm Structures
Foods
Clothing
Business of the Household
Home Care of the Sick

Special Fruit School
Special Floriculture School
Special School for Greenskeepers
Professional Improvement Problems
Agricultural Education
Ten Day Dairy Courses in:
Milk Testing
Milk Plant Operation
Ice Cream Making

The Winter School appeals to practical farmers and all who wish short intensive, yet thorough courses suited to the practical man.

Stockbridge Hall and Dining Hall

THE M. A. C. BULLETIN
Amherst, Massachusetts

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CALENDAR, 1928-1929
The Stockbridge School of Agriculture

1928

October 1, Monday	Freshman Registration
October 2, Tuesday	Senior Registration
October 3, Wednesday, 8 A. M.	Fall term begins
October 12. Friday	Holiday, Columbus Day
November 12, Monday	Holiday, Armistice Day
November 28-December 3, Wednesday, 12 M.—Monday, 8 A. M.	Thanksgiving Recess
December 22, Saturday, 12 M.	Fall term ends

1929

January 2, Wednesday, 8 A. M.	Winter term begins
February 22, Friday	Holiday, Washington's Birthday
March 16, Saturday 12 M.	Winter term ends
March 25, Monday, 8 A. M.	Spring term begins
April 19, Friday	Holiday, Patriot's Day
May 30, Thursday	Holiday, Memorial Day
May 31—June 3, Friday—Monday	Commencement
September 30, Monday	Freshman Registration
October 1, Tuesday	Senior Registration
October 2, Wednesday, 8 A. M.	Fall term begins
October 12, Saturday	Holiday, Columbus Day
November 11, Monday	Holiday, Armistice Day
November 27-December 2, Wednesday 12 M.—Monday, 8 A. M.	Thanksgiving Recess
December 21, Saturday, 12 M.	Fall term ends

1930

January 2, Thursday, 8 A. M.	Winter term begins

STAFF
Officers of General College Administration

Roscoe W. Thatcher, D.Agr., LL.D.
President of the College

William L. Machmer, A.M.
Dean of the College

Robert D. Hawley, B.S.
Secretary of the College

Fred C. Kenney
Treasurer of the College

Basil B. Wood, A.B.
Librarian of the College

Roland H. Verbeck, B.S.
Director of Short Courses

The Faculty of Instruction

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Luther Banta, B.S. .... Sunset Avenue
Assistant Professor of Poultry Husbandry

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Assistant Professor of Farm Management

Alexander E. Cance, Ph.D. .... 9 Fearing Street
Professor of Agricultural Economics and Head of Department

Calton O. Cartwright, B.Voc.Agri. .... Northampton
Instructor in Horticultural Manufactures

Walter W. Chenoweth, A.B., M.S. .... North Amherst
Professor of Horticultural Manufactures and Head of Department

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Assistant Professor of Agronomy

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Assistant Professor of Horticulture

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Agricultural Counselor of Women
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Professor of Physical Education and Hygiene and Head of Department
Mrs. Curry S. Hicks .... Sunset Avenue
Instructor in Physical Education
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Instructor in Agronomy
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Assistant Professor of Agricultural Economics

Instructor in Agronomy

THE STOCKBRIDGE SCHOOL OF AGRICULTURE

A Two-Year Course in Practical Agriculture

The Stockbridge School of Agriculture was organized in 1918 to meet the demand for a short course in agriculture that might be taken by students who either did not possess college entrance requirements, or who, for one reason or another, were unable to take the four-year college course.

In May 1928, by vote of the trustees of the College, the name was changed from "The Two-Year Course in Practical Agriculture" to "The Stockbridge

School of Agriculture". This change, it is expected, will more clearly emphasize the distinction between the degree courses and the non-degree courses offered by the College, and will correct the impression that students completing this course have completed two years of the college course. Graduates of The Stockbridge School of Agriculture are not eligible for entrance in the College and their school credits are not accepted as college credits.

Since its organization, at the request of the Massachusetts Legislature, the Two-Year Course in Practical Agriculture has registered over 1,000 students. There are now over 500 graduates of the course. Practically all of these are in Massachusetts or in New England, but graduates of the course are to be found in Florida, California, and many other states of the Union. More than 200 students registered in the School during the past year.

The growth of the course and the demand for more specific vocational training made necessary a reorganization of the work in 1921. As now arranged the student may specialize in one of seven vocations,—animal husbandry, dairy manufactures, floriculture, horticulture, pomology, poultry and vegetable gardening. This specialization does not prevent his securing a general working knowledge of other subjects.

The Stockbridge School will appeal not only to young men and women, but also to men and women of mature years and practical experience who wish to know more about the business of farming or associated agricultural industries.

AGRICULTURAL PLACEMENT

The work of placing students for apprentice training is in charge of the supervisor of placement training. (1) positions are secured that will enable a student to gain practical experience in his particular vocation; (2) a student desiring placement on his home farm may arrange for such assignment if the supervisor approves. As a rule, it will be found better for a student to spend this six months away from the home farm, even though he plans to be employed on the home farm after finishing the course. This statement is based on the experience of students who have already taken the course.

If credit is to be secured for the six months' placement training the following conditions must be carefully observed: (1) the student must interview the supervisor early in his first year in order that his qualifications, the type of farming he wishes to pursue, and his general fitness may be determined; (2) no arrangement for placement training may be made by the student himself until the supervisor has been consulted; (3) students are required to complete their period of training without unnecessary absences; (4) no transfers are to be made by a student if he is to receive credit until permission has been had from the supervisor; (5) a position may not be given up by the student until the supervisor has been notified; (6) a monthly report must be furnished on the form supplied, and submitted not later than the fifth of each month during his training period; (7) a student whose grade of work is regularly poor (below a 70 rating) in the classes of his major subject will not be eligible for placement training, unless recommended by the department in charge of his major work; (8) when a student fails to complete the requirements of his placement training with a satisfactory grade, he is not allowed to take the work of the second year; (9) all male students are given a thorough physical examination by the Department of Physical Education at the beginning of the college term. Any disabilities liable to affect the student's placement work are noted, and, if of a serious nature, recommendations for corrective measures are supplied. Parents should understand that most kinds of agricultural work require a well-balanced combination of brawn and brain. No student whose physical condition is questionable will be accepted for placement training without a physician's certificate, and parent's approval.

It should be clearly understood by both employer and employee that the same energy, regularity and general conduct will be expected of the student during his period of placement training as is expected in his work in classes and on the campus.

It should also be noted that this six months' experience is educational in its nature. Students are expected to earn and receive a reasonable wage, but the purpose of the training is the experience gained rather than the wage earned. The scale of wages may vary in different localities, but each man's ability is given very careful thought, that he may obtain a wage that is fair to him. In the event of any misunderstanding the supervisor should be immediately informed.

RULES AND REGULATIONS

Absences from Class

(1) No unexcused absences will be allowed from classes. (2) all excuses for absence shall be presented by the student in writing, and, if approved by the Director, an excuse card will be granted to be signed by the instructor. Excuse cards must be returned promptly to the office when properly signed. (3) Students presenting excuse cards covering absences are expected to make up all work missed, to the satisfaction of the instructor. (4) Absences for which no excuse card is presented shall be counted as zero in determining grades. (5) **No excuses will be accepted at the Short Course Office unless presented within two days after the student returns to classes. (6) Two tardinesses unexcused shall count as one absence. (7) Absences from classes immediately before or after a holiday are not allowed except by special permission. (8) Students failing to observe these rules are placed on probation, and may be asked to withdraw from the course if further violations occur.**

Absences from Examinations or Tests

(1) Any student who absents himself from an appointed examination without sufficient cause shall be given zero thereon. In such case he shall not be entitled to a make-up examination unless the Director so requests. A previously announced test may, at the discretion of the instructor, be regarded as a test or as an examination.

(2) Every absence taken before enrollment (the signing of the registration card by the teacher) in a class will be counted.

General Information

Instruction.—The instruction is given by the regular faculty by means of classroom teaching, laboratory exercises and practical work. The work of the classroom is supplemented by demonstration work in the laboratory, dairy room, greenhouse and stables. It is designed to offer plain, practical, direct information, and to establish the underlying reasons as well as the method employed in the various operations. The advantages of the college staff of specialists and the college plant with all its resources are thus made available to young men and women electing this course.

Entrance Conditions.—Students must be seventeen years of age or over and have completed at least an elementary school course or its equivalent. They must have completed six months' practical experience approved by the supervisor of placement training before they will be permitted to enroll for the work of the second year.

The Stockbridge School of Agriculture is not intended for students already enrolled in high schools. Such students should finish the high school course. Students enrolled in high schools who wish to take the course should bring a statement, either from the principal of the high school or from the parent or guardian, requesting enrollment.

Graduates of county schools of agriculture or of agricultural department of high schools may complete the course for a diploma in one year, if they are recommended by the Director of the school or the agricultural instructor.

Scholarship in agricultural subjects and practical experience must be satisfactory. When this is deficient, the diploma may be withheld until the placement training of six months is completed for required credits.

Credit and Diploma.—In order to obtain a diploma a student is expceted to have satisfactorily completed all of the work called for in the general course which he has selected. A total of 125 credits is required for graduation, of which twenty-five credits, or one-fifth of the total, are assigned to practical training. A student failing to meet the requirements in his six months' summer training cannot be enrolled for his second year, since he is not entitled to the diploma of the School.

A credit is given for one class hour, of either recitation or lecture, per week throughout a term of twelve weeks. Each two-hour laboratory period also counts for one credit. The course calls for a minimum of twenty credits each term, that is, four subjects meeting five times per week, either in class or laboratory. Upon the satisfactory completion of the course, the student is awarded the diploma of the School. **A diploma will not be issued to any student whose record shows a deficiency in any subject or in his placement training.**

Scholarship.—At the close of each term students receive a formal report showing the standings given in the subjects pursued by them. If a student's work is deficient in 50 per cent he may be asked to withdraw.

If a student's term mark in any subject falls below 60 per cent, or if he drops a course without the consent of the Director, he is thereby failed (F) in that subject. He shall be debarred from taking the final examination in that subject and must repeat it with the following class.

If the average of the term mark and the final examination is below 60 per cent, the student is thereby conditioned (#).

How to Enroll.—Each student is required to file with the treasurer of the college a statement, signed by the town (or city) clerk of the town (or city) from which he enrolls, stating that the parent or guardian of the student is a resident of that town. A blank for this purpose is inserted at the end of this catalogue. Upon arrival report at the office of the Director of Short Courses, located in South College, where information may be obtained in regard to board and room, schedule of classes, etc.

Student Expenses

Tuition.—A tuition fee of $20 per term is charged students, residents of Massachusetts, enrolled in the Stockbridge School of Agriculture. Students who are not residents of Massachusetts are charged a tuition fee of $60 a term. The tuition charged persons not citizens of the United States is $60 a term. **Students entering from Massachusetts are required to file with the President a statement signed by either town or city clerk, stating that the applicant's father is a legal resident of Massachusetts.**

All students entering the college for the first time in this course are charged a matriculation fee of $5, which, in event of a student leaving the institution shall, if all bills due the college are paid, be remitted, or which shall upon graduation be considered as payment for the diploma.

Laboratory Fees

The principles observed in establishing laboratory fees are the requirement that students pay for those materials actually used which cannot be supplied by the individual, and that the laboratory fees include a charge sufficient to guard against wanton waste and breakage. Fees may be established for any course without previous announcement. At present the fees charged are as follows:—

	Per Term
Agronomy S-1	$1 50
Agronomy S-2	2 00
Animal Husbandry S-1, S-5	1 50
Animal Husbandry S-4	1 00
Bacteriology S-2	5 00
Dairying S-1, S-2,S-3, S-4	3 00
Floriculture S-3, S-5	3 00
Floriculture S-6	5 00

Horticulture S-1	1 00
Horticulture S-5, S-6, S-7	1 50
Poultry S-1, S-2, S-3, S-4, S-5	2 00
Rural Engineering S-1, S-2, S-3, S-4, S-5, S-6, S-7	1 50
Vegetable Gardening S-1, S-2	1 50

INITIAL CHARGES

At the opening of the college year, before students are registered in their classes the following charges are payable at the treasurer's office.

Matriculation fee	$5 00	—
Board (at college dining hall) October 3 to December 1	61 00	$61 00
Assessment for support of Social Union	1 50	1 50
Laboratory fees	See schedule	See schedule
Student tax for support of athletics[1]	15 00	15 00
Student tax for support of non-athletic activities[1]	3 00	3 50

The necessary college expenses are estimated as follows:—Tuition: citizens of Massachusetts, $20 per term, or $40 for the first six months of class work (two terms), and $60 for the second year of nine months (three terms); total tuition charge for the two-year course, $100.

	First Year	Second Year	Total
Matriculation fee	$5 00	—	$5 00
Room in private houses	72 00	$108 00	180 00
Board at college dining hall, Required attendance for freshmen, $7.50 per week	165 00	235 00	400 00
Laundry, $.50 to $.85 a week	20 00	30 00	50 00
Laboratory fees, average	10 00	15 00	25 00
Books, stationery, and miscellaneous items	30 00	45 00	75 00
Totals	$302 00	$433 00	$735 00
Mass. student tuition	40 00	60 00	100 00
Grand total	$342 00	$493 00	$835 00

The six months' placement training between the first and second years enables a student to earn from $300 to $450 depending upon his skill and general ability, and the type of work. Of this amount $200 to $300 should be saved to apply to the expenses of the second year.

Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial obligations voluntarily placed upon students which they should expect to meet. Chief among these are class assessments and taxes levied for maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, etc. Such expenses vary from $15 to $30 a year. Additional financial responsibility is also assumed by students joining clubs or entering into other social activities of the college. Besides the amount necessary for clothes and traveling, the economical student will probably spend between $400 and $500 per year.

Student Aid

SELF HELP.—Many students are obliged to find work of some sort to earn their way through college. It is recommended that no new student enter without having at least $250 and preferably $350 with which to pay his way until he can establish himself in some regular work. **The college does not encourage students to enter without money in the expectation of earning their way entirely.** The student will find it better either to work and accumulate money before coming to college, or to take more than two years in completing his course, or, instead, to borrow money sufficient to carry him through. No student should undertake work that interferes with his studies, and students should understand that, owing to the large number of applications for employment, no one man can receive a large amount of work at the college. A number of students find opportunities for earning money without depending upon the college to furnish them with work.

Students whose deportment or class work is not satisfactory are not likely to be continued in student labor. **Opportunities for labor for Short Course men on** the campus are limited to second-year men. Students, therefore, may find it rather difficult to obtain all the work they desire during their first year; as a matter of fact, however, any student who is capable of doing a variety of things, and who is a competent workman, usually finds little difficulty in obtaining all the work that he can do from the outset.

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[1] While this is not essentially a college charge, the Treasurer of the college acts as collector for the student activity, and all students are expected to make the payment as indicated. The subscription price of the "Collegian" is fixed by the managers, the amount of athletic tax by vote of the student body.

Rooms

Students must secure rooms approved by the college. The assignment of rooms, and the general supervision of the housing of students, is in charge of the Director of Short Courses.

Women students are expected to occupy rooms in the college dormitory and such houses or apartments as the college may provide, and board at the college dining hall. No woman student will be allowed to room in a private house without a special written permission from the Director.

General Exercises

Chapel exercises are held two mornings each week. On Wednesday an afternoon assembly is held, to which some prominent layman or professional man is invited to speak. The object of these assemblies is to bring to the students discussions of topics of present-day interest. A special chapel service on Sunday is usually held during the winter months. Students are required to attend these general exercises, although the Director is authorized to excuse from Sunday chapel any student who may object to attendance thereon because of his religious scruples. Freshmen must attend during the first term.

Student Activities

A large number of student organizations furnish opportunity to students for work and leadership.

The Massachusetts Agricultural College Social Union was established about fifteen years ago. All students become members of the Union by paying a small fee, and in the fall and winter months the Union gives a series of entertainments, free to students and faculty. The Memorial Building is the center of student activities. Offices for the various student organizations, including the Two-Year Student Council, are maintained in this building. On the first floor are located a lounging room, the Memorial Room, and the offices; in the basement, bowling alleys, pool tables, store, post office, and barber shop; and on the second floor an auditorium for meetings and dances. This building was erected by the alumni, students, faculty, and friends in honor of the fifty-one "Aggie" men who gave their lives in the World War.

The Young Men's Christian Association is active both socially and religiously. A Catholic Club has also been organized.

The Two-Year Council is composed of representatives of the first and second year classes. This body serves as general director of the conduct in classes of the Two-Year men, and represents before the faculty the interests of this group of students.

A student year-book called "The Shorthorn" is published annually by the members of the graduating class, and is usually issued in June.

In the place of fraternities the faculty have authorized social organizations called "clubs" in the Stockbridge School. There are two such organizations in the student body, the A. T. G. Club and the Kolony Klub.

Athletics.—The School has its own separate athletic progam with regular schedules in football, basketball, ice hockey, and baseball for the seniors. Freshmen are on placement training during the spring term so that only seniors are available for baseball. This work is all under the supervision and direction of the Department of Physical Education of the College and coaches are provided for all sports. Students also subscribe to the College varsity games and have attendance privileges for varsity sports on the campus. Sweaters and insignia are awarded to Stockbridge School athletic teams. The official insignia is the letter S.

Plans are under way to secure funds for a new building to house all athletic activities of the College. Ample facilities will then be provided to carry on a very complete program of sports and recreation for Stockbridge School students.

Student Relations

The customary high standard of college men in honor, manliness, self-respect, and consideration for the rights of others constitutes the standards of student deportment.

Any student known to be guilty of dishonest conduct or practice must be reported by the instructor to the President for discipline.

The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable.

It should be understood that the college, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet, if in the judgment of the college authorities a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct.

Infirmary

The college maintains an infirmary for the care of sick or injured students. The buildings now available for this purpose are quite inadequate for the needs of the institution, and it is hoped that in the near future other buildings of this kind may be erected and the general equipment somewhat amplified. At present two small buildings, built especially for hospital purposes, are used for the infirmary.

The following statement outlines the plan followed in the management of the infirmary with respect to students:—

Management of the Infirmary

Supervision

1. The infirmary is under the *general supervision* of Professor Curry S. Hicks, who is designated as Supervisor of the Infirmary. A resident nurse is in *immediate* charge of the Infirmary.

Use of Infirmary

2. Students are urged to go to the infirmary at any time that they are in need of the services rendered by the resident nurse or by a town physician. Inasmuch as the physical director gives special attention to all student diseases, it is to be expected that the majority of the students will go to the infirmary at his suggestion. This understanding, however, should in no way deter students from going to the infirmary voluntarily at any time.

General Health

3. Students are urged to consult the physical director or the resident nurse immediately when signs of physical disorder appear. Severe attacks of cold or other forms of illness can usually be avoided if treatment is administered in the

incipient stage. The purpose of the infirmary is to help maintain the general good health of the students, as well as to furnish a suitable place for professional attention in cases of severe illness or accident.

General Fee

4. The infirmary fee will be at the rate of $2 a day, and will be charged when one or more meals are obtained at the infirmary or when the student remains at the infirmary for one or more nights. A nominal charge will be made to outpatients for miscellaneous treatment of a minor character.

Additional Expenses

5. In addition to the fee charged as specified in paragraph 4, the following additional expenses will be charged to the patient:—

(*a*) *Nurses.*—In case a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the resident nurse.

(*b*) *Professional Service.*—If a student requires medical attention by a physician, he will be required to select his physician and become responsible for fees charged by the physician.

(*c*) *Supplies.*—Special medical supplies prescribed by a physician or nurse will be charged to the patient.

(*d*) *Laundry.*—Expense for personal laundry incurred by students while in the infirmary will be charged to the individual student.

The Library

The College Library occupies the entire building formerly partly occupied by the chapel. It contains more than 81,300 bound volumes and a very large collection of pamphlets, probably twice as numerous, which are of great practical value, being monographs on the technical subjects studied in the college. These pamphlets include particularly the publications of the United States Department of Agriculture and those of the State Experiment Stations of other Agricultural colleges in this country and abroad. Among the bound volumes, works on agriculture, horticulture, botany, entomology and the various sciences connected especially with agriculture predominate, but literature, history, economics, religion, sociology and art are also well represented. More than six hundred periodicals covering technical and general subjects, and including the best farm papers, are regularly taken and both the current numbers and the back files are readily accessible.

The Library is open for readers from 8 A. M to 10 P. M. during term time and during part of Sunday. Vacation hours are somewhat shorter.

Short Course Students will find in the Library helpful material of many sorts in connection with their work, and are cordially invited to make use of this material. The librarian and library assistants are always on hand, ready and anxious to help.

Agricultural Opportunities for Women

Agriculture is a field in which women are finding increasingly good opportunities. Poultry keeping, fruit growing, floriculture, dairying, truck farming, general farming,—all offer favorable openings for women. In all of these branches of agriculture women are farming independently. Women are also filling paid positions which include farm and estate managers and workers, garden supervisors, and workers in boys' and girls' agriculture clubs.

For the woman or girl whose home is already upon the farm the opportunity is exceptionally good. With the help of an agricultural education there are open to her many means of increasing her own or the farm income. With the knowledge of farm life which she already possesses, and with the possibility of securing occasional help from her family, she can easily carry on and develop a profitable enterprise of her own. The Stockbridge School of Agriculture will afford to the women who wish to engage in farming the practical training which they will need to fit them for their work, and will open to them new doors of opportunity. The particular problems which the women engaged in farming will have to meet, and the special lines of farming in which they will have favorable opportunities, will be considered in a series of conferences.

Women who are interested in taking agricultural courses should correspond with Miss Margaret Hamlin, who acts as adviser for agricultural courses for women. Women interested in home economics should address Professor Edna L. Skinner.

Positions

The College does not guarantee positions to students registered in any of its courses, but it has an opportunity to recommend students for a large number of positions. A record is kept of each student's work and experience, and of his success in positions for which he has been recommended after he has finished his course. The opportunities for trained men and women, especially those who have had farm experience, are exceptionally good.

A student desiring a recommendation from the college must meet the following conditions:—

(1) He must be of good character.
(2) His previous record must be good.
(3) His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of practical experience cannot, as a rule, be recommended for positions of responsibility. This is especially true of the better positions for which managers or superintendents are wanted.

ANIMAL HUSBANDRY

The Animal Husbandry major fits students to cope with the practical problems of live-stock production and management. It supplements and supports but does not duplicate or replace the necessary experience gained only through actual manual work in caring for animals. As a foundation, the study of breed history, live-stock trends, animal anatomy and physiology is required. Special attention is given to physiological processes in breeding and feeding. Later courses show how these processes actually function under the stockman's guidance.

A herd of about 200 dairy cattle including Ayrshires, Guernseys, Jerseys, Holsteins and Milking Shorthorns, a band of about a dozen Percheron brood mares, a flock of about 60 Southdown and Shropshire sheep and a herd of about 50 Berkshire and Chester White swine together with the modern barns and equipment for housing and caring for the above live stock and a farm of several hundred acres used primarily for the production of feed crops gives ample scope for illustrating and giving practice in modern methods of live-stock handling. The farm and barns are our laboratory; the animals and accessories our equipment.

Graduates from the Animal Husbandry major for the most part secure positions as herdsmen or farm managers.

Animal Husbandry

First Year

Fall Term	Winter Term	Spring Term
Agronomy S-1 (Soil Management)	Agronomy S-2 (Manures and Fertilizers)	Six months' farm placement training
Animal Husbandry S-1 (Types and Breeds)	Animal Husbandry S-2 (Principles of Feeding)	
Dairy S-1 (General Dairy)	Bacteriology S-1 (Bacteriology and Rural Hygiene)	
Poultry S-1	Business Law S-1	
Tractor Practice	Motors S-2	
Electives	Milking, Harnessing and Teaming	
English S-1		

Second Year

Fall Term	Winter Term	Spring Term
Agricultural Engineering S-1 (Farm Engineering)	Agricultural Economics S-1	Agronomy S-3 (Crops)
Agricultural Engineering S-3	Animal Husbandry S-4 (Herd Book Study and Animal Breeding)	Animal Husbandry S-5 (Live-stock Management and Stock Judging)
Agricultural Engineering S-7	Farm Management S-1 (Farm Management and Accounts)	Vegetable Gardening S-6 (General)
Animal Husbandry S-3 (Feeding Practice)	Pomology S-7 (General)	Veterinary Science (Animal Sanitary Science)
Rural Sociology S-1 (Social and Economic Problems)	**Electives**	**Electives**
	Animal Husbandry S-7 (Farm Meats)	English S-3
	Forestry S-1	

Animal Husbandry S-1. (Types and Breeds.) I.

Includes a study of the history and development of the various breeds of cattle, horses, sheep and swine together with a discussion of the conditions to which each breed seems best adapted. Laboratory work consists of judging and evaluating as many rings of all the classes of farm live stock as time will permit. Textbook: Plumb, "Types and Breeds of Farm Animals."
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Animal Husbandry S-2. (Principles of Feeding.) II.

A study of the fundamental principles of animal nutrition, of the composition of feeding materials and their relative importance for the different classes of farm animals in New England. The latter part of the course is devoted to a study of feeding standards and to the calculation of rations for all classes of farm live stock. Textbook: Henry and Morrison, "Feeds and Feeding."
5 class hours a week. Credits, 5.

Animal Husbandry S-3. (Feeding Practice.) I.

A continuation of S-2 showing the application of the principles of nutrition in economic live-stock production, and including the management and feeding of horses, cattle, sheep and swine of all ages. Feeding and managerial problems are assigned for outside work followed by ample classroom discussions. Prerequisites: Animal Husbandry S-1 and Animal Husbandry S-2. Textbook: Henry and Morrison "Feeds and Feeding."
5 class hours a week. Credits, 5.

Animal Husbandry S-4. (Animal Breeding and Herd-Book Study.) II.

Includes a study of the physiology of reproduction and of animal genetics as well as the art of breeding. Among the topics included are the Origin and Domestication of Farm Animals; Modern Theories of Heredity, Variation and Sex Determination; the Systems of Breeding—Cross-, Out-, Line-, and Close-Breeding; and the one paramount problem of animal breeding, namely, Selection. Considerable pedigree work in the student's favorite breed is also included. Prerequisites: Animal Husbandry S-1 and Animal Husbandry S-2. Textbook: Rice, "Breeding and Improvement of Farm Animals."
4 class hours and 1 2-hour laboratory period a week. Credits, 5.

Animal Husbandry S-5. (Live-Stock, Management, Stock Judging and Equitation.) III.

The first half of the term will be devoted to practical work in handling, fitting and judging live stock. The last half of the term will be devoted to lectures covering the feeding, selection and management of riding or cavalry horses, and practice in riding. The riding practice will consist of drills on the military field and cross-country trips, by arrangement with the Military Department. Prerequisites: Animal Husbandry S-1, Animal Husbandry S-2, Animal Husbandry S-3, Animal Husbandry S-4.
5 2-hour laboratory periods a week. Credits, 5.

Animal Husbandry S-6. (General Animal Husbandry.) II.

Consists of a general study of animal husbandry; types and market classes of live stock, breeds of farm animals, principles and practice of feeding, live-stock breeding; and management of herds, flocks and studs. Laboratory work is given in live-stock judging and management. As much detail of this broad subject is given as is consistent with time allotted. Textbook: Plumb, "A Study of Farm Animals."
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Animal Husbandry S-7. (Farm Meats.) II.

This course is the complement of the production course previously given and permits the student to follow the product (beef, pork, veal and lamb) through the farm barn and feed lot to its final destination, the consumer's table. Practice is afforded in the killing, cutting and curing of beef, pork, veal and lamb. Included in this course is a trip to several large packing houses in Boston, consuming two days and costing about $20. Prerequisites: Animal Husbandry S-1, Animal Husbandry S-2, Animal Husbandry S-3. Textbook: Tomhave, "Meat and Meat Products."
1 class hour and 1 4-hour laboratory period a week. Credits, 3.

Note.—Every student in this course must qualify in tractor practice, milking, harnessing, and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put in placement training who has not satisfied these preliminary requirements.

DAIRY MANUFACTURES

The Dairy Manufactures course is designed to fit men for positions with market milk concerns, creameries, ice-cream factories, and specialized dairy farms.

All dairy manufacturing work is given in the dairy building (Flint Laboratory), a modern building designed especially for dairy work. The building is equipped with the newest and best types of dairy and creamery machinery.

The market milk room contains two complete pasteurizing units, a clarifier, separator, milk heater, automatic bottle filler and capper, and other necessary equipment for the proper handling of market milk.

The ice-cream making room contains a brine freezer, a direct expansion freezer, and additional equipment such as is found in a modern ice-cream plant.

The room designed for cheese making is equipped with cheese vats, draining racks, presses, mixer, etc. The butter making room has various types of hand and power churns, workers, scales, and other accessories.

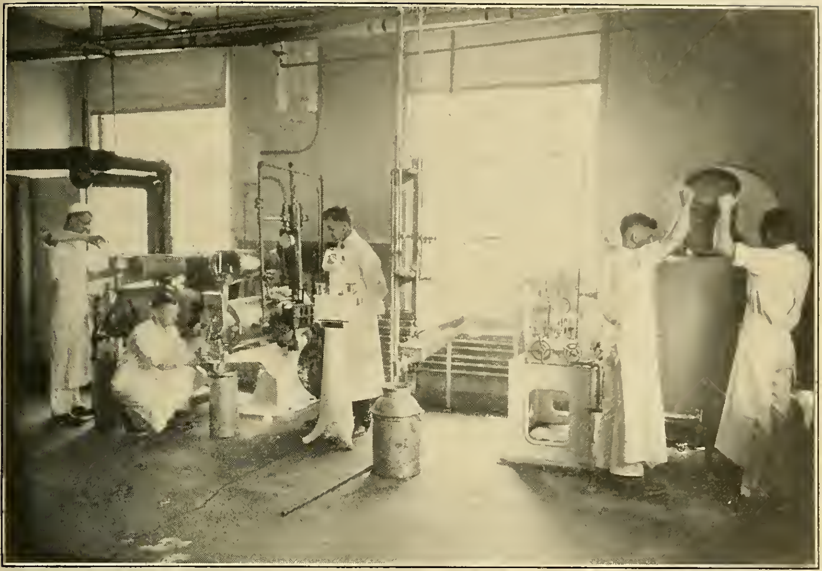
The separator room contains a complete collection of separators and exhibits of modern equipment and supplies for the dairyman.

The testing laboratories are well equipped with apparatus for the Babcock and Mojonnier tests.

Dairy Manufactures

First Year

Fall Term	Winter Term	Spring Term
Agronomy S-1 (Soil Management)	Agronomy S-2 (Manures and Fertilizers)	Six months' farm placement training
Animal Husbandry S-1 (Types and Breeds)	Animal Husbandry S-2 (Principles of Feeding)	
Dairy S-1 (General Dairy)	Bacteriology S-1 (Bacteriology and Rural Hygiene)	
Poultry S-1	Business Law S-1	
Electives	Motors S-2	
English S-1		



Ice Cream Making

A Class in Cooking

Second Year

Fall Term	Winter Term	Spring Term
Bacteriology S-2 (Dairy Bacteriology)	Agricultural Economics S-1	Agricultural Engineering S-5 (Dairy Mechanics)
Dairy S-2 (Ice Cream Making)	Dairy S-3 (Market Milk)	Dairy S-4 (Butter Making and other products)
Rural Sociology S-1 (Social and Economic Problems)	Farm Management S-1 (Farm Management and Accounts)	Veterinary Science S-1 (Animal Sanitary Science)
		Electives
		English S-3

Dairy S-1. (General Dairy.) I.

This course takes up the question of the importance of dairying in the United States, and especially in the New England States, giving the development of dairying from the earliest to the present time. It covers the secretion, composition, and properties of milk; reasons for variation in the per cent of fat in different samples of milk; the Babcock test for fat in milk and other dairy products; other common milk tests; the advantage of testing herds, cow test associations, advanced registry work; the handling of market milk; soft cheese making, ice-cream making, and butter making as applied to general farm conditions. The laboratory work consists mainly in testing milk and dairy products for butter fat, solids, and acidity, together with some laboratory work in milk handling, butter making, cheese making, and ice-cream making.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Dairy S-2. (Ice-cream Making.) I.

In this course a careful study is made of modern methods of manufacturing the common frozen dairy products (ice-cream, sherbets, and ices, also frozen puddings, punches, mousses, etc.).

The lecture work includes a discussion of the history of ice-cream making, the ingredients found in ice-cream, methods of preparing and standardizing mixes, the freezing process, methods of hardening, marketing, and distribution of the finished product.

The laboratory work involves the preparation and standardization of ice-cream mixes, the freezing of ice-cream and other frozen dairy products, and laboratory tests for butter fat and total solids in ice-cream.
4 class hours and 3 3-hour laboratory periods a week. Credits, 9.

Dairy S-3. (Market Milk.) II.

This course takes up the history of market milk, its food value and use. Attention is given to the necessary essentials in producing a clean product; the economics of milk production; the advantages of co-operative milk producers' organization; the various methods of marketing milk; clarification; pasteurization; cooling, etc.

The laboratory work consists of receiving and making quality tests on milk and the operation of the machinery used in processing market milk. In addition, trips to dairy farms and a one-day trip, with estimated cost of $5.00, will be made to city milk plants.
4 class hours and 3 3-hour laboratory periods a week. Credits, 9.

Dairy S-4. (Butter Making and Other Dairy Products.) III.

A large part of this course consists of the study of butter making; other products are, cheese and "surplus products."

Under butter making the principal factors studied are: methods of separating milk, the history, selection, care, and use of separators; the pasteurization and ripening of cream; testing cream for acidity; the making and use of starters; a study of churns and churning; modern methods of making butter; marketing butter; tests for moisture, salt, fat, and curd content of butter.

Lectures are given covering the manufacture of other milk products (cheese, commercial buttermilk, casein, condensed milk, milk powder, etc.). The manufacture of hard and soft cheeses (cheddar, pimento, olive, nut, neufchatel, cottage, etc.) is considered, either from the standpoint of marketing the entire milk supply of the dairy through these products or the economic disposal of surplus milk.

The laboratory work covers the operation of separators and churns, the making of butter, hard and soft cheese, commercial buttermilk, etc. In addition, a one-day trip, with estimated cost of $5.00, will be made to city dairy plants. 4 class hours and 3 3-hour laboratory periods a week. Credits, 9.

POULTRY HUSBANDRY

Seven courses are offered by this department. One is a general course designed particularly to equip the student with the fundamental principles underlying successful poultry keeping as related especially to the farm flock. The other six courses are for the student who desires to specialize in poultry culture.

There is a broad field of opportunity for adequately trained men in the commercial handling and sale of poultry and poultry products, specialists in incubation, brooding and rearing, and assistants or managers of commercial poultry farms. Good profits and wages await well-equipped men and women in these and other branches of poultry work.

This department is well equipped to offer practical instruction in poultry husbandry. Our quarters and equipment in Stockbridge Hall provide ample facilities for efficient classroom and laboratory teaching.

Our practical laboratory (college poultry plant) comprises about 1,500 adult birds, divided into some 40 pens of various designs, the flocks ranging in size from 10 to 250 birds; thirty lamp incubators, as well as four mammoth machines; brooding and rearing facilities for 5,000 chicks, including many styles of stove, kerosene and electric brooders; facilities for practice in pen management, fattening, killing, picking, caponizing, judging, mixing rations; construction of poultry houses and appliances, etc.

In addition to the actual practice work performed, the student has an opportunity to keep under observation practical experiments and demonstrations continually under way for the instruction of students and practical poultry keepers.

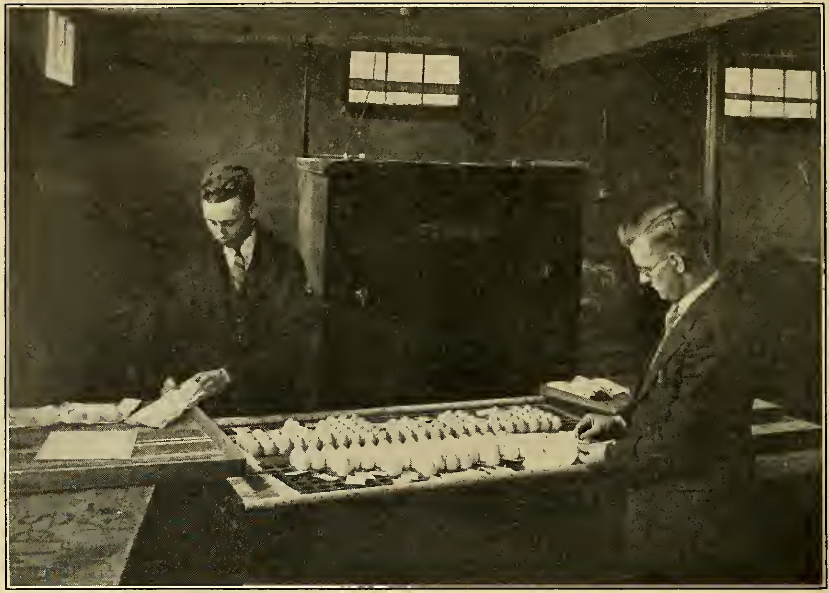
Poultry

First Year

Fall Term	Winter Term	Spring Term
Agronomy S-1 (Soil Management) Animal Husbandry S-1 (Types and Breeds) Dairy S-1 (General Dairy) Poultry S-1 Tractor Practice **Electives** English S-1	Agronomy S-2 (Manures and Fertilizers) Bacteriology S-1 (Bacteriology and Rural Hygiene) Business Law S-1 Motors S-2. Poultry S-2 Milking, Harnessing and Teaming	Six months' farm placement training

Second Year

Fall Term	Winter Term	Spring Term
Agricultural Engineering S-3 Agricultural Engineering S-7 Entomology S-1 (Beekeeping) Poultry S-3 Poultry S-7 (Poultry Sanitation and Poultry Specialties) Rural Sociology S-1 (Social and Economic Problems)	Agricultural Economics S-1 Farm Management S-1 (Farm Management and Accounts) Pomology S-7 (General) Poultry S-4	Agronomy S-3 (Crops) Entomology S-2 (Beekeeping) Poultry S-5 Vegetable Gardening S-6 (General) **Electives** English S-3



Students Starting a Pedigree Hatch

Field Study of Tillage Implements

Poultry S-1. (Judging and Housing.) I.

This course embraces a study of the various economically important types and breeds of domestic fowl, judging for egg production capacity, and for exhibition quality. A visit to one Connecticut Valley poultry show may be required. This course also covers the principles and practices of constructing and equipping houses on a commercial poultry farm.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Poultry S-2. (Incubation and Brooding.) II.

A study of incubation and brooding is made by means of the operation of standard incubators and brooders and through a consideration of basic principles. Students select and grade hatching eggs; complete a hatch in small incubators and run mammoth incubators for a period of time. Under supervision each student has charge of a brood of chicks.
2 class hours and the equivalent of 3 2-hour laboratory periods. Credits, 5.

Poultry S-3. (Feeding and Marketing.) I.

A study of the common poultry feeds, feeding principles and successful commercial farm practices. For organized practice, the feeding and management of a pen of birds for a few weeks will be required. This course also covers candling, grading and packing eggs, market classification of poultry and eggs, judging eggs, fattening, killing, dry and scald picking, drawing, shaping and packing poultry, judging of live and dressed market poultry, the requirements of various markets and relative merits of different systems of marketing. Each member of the class is required to fit entries for the Annual Market Poultry Show.
4 class hours and 2 2-hour laboratory periods a week. Credits, 6.

Poultry S-4. (Poultry Breeding.) II.

The course includes the study of the improvement of poultry by means of mass selection, "seed-plot" and pedigree methods of breeding. Students follow through each step of a pedigree hatch and assist in the selection of the breeders used at the college plant. Basic principles of heredity necessary for an understanding of good breeding practices are studied.
3 class hours and 2 2-hour laboratory periods per week. Credits, 5.

Poultry S-5. (Poultry Farm Management.) III.

In this course the following points are given special attention: lines upon which a well-organized poultry farm is developed, the general arrangement of plots and buildings, record keeping, accounting and advertising, and a study of surveys. A trip covering two or three days will be made to representative successful poultry farms. The expense per student is approximately $15. This is required of each student taking the course for credit.
4 class hours and the equivalent of 1 2-hour laboratory period per week.
Credits, 5.

Poultry S-6. (General Poultry Course.) II.

Poultry keeping as a national industry; its importance and geographical distribution; opportunities and possibilities in poultry culture in Massachusetts; principles of feeding; utility classification of fowl; incubation, both natural and artificial; the production and packing of hatching eggs; the baby chick industry; and brooding and rearing. Practical exercises will be closely correlated with the breeds and varieties, studies of various types and sizes of incubators, brooders, and brooder houses.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Note.—Students who take course 6 must get permission from the Poultry Department to take advanced poultry courses.

Poultry S-7. (Poultry Sanitation and Poultry Specialties.) I.

This course aims to acquaint the student with the normal hygienic conditions under which our domestic poultry thrive best. Sufficient anatomy and physiology will be given to enable the student to distinguish between normal and abnormal conditions. The nature of disinfectants and external and internal antiseptics will be stressed and the students made acquainted with the best usages both scientific and practical in conducting a sanitary program for disease prevention and control. A special effort will be made to link the sanitary, hygienic, and disease control problems with the so-called down-to-date practices in feeding, housing and general management. The general care and breeding of ducks, geese, squabs, and turkey and the importance and management of game farms will be featured in this course.
4 class hours and 1 2-laboratory period a week. Credits, 5.

Note.—Every student in this course must qualify in tractor practice, milking, harnessing, and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put in placement training who has not satisfied these preliminary requiremennts.

FLORICULTURE

Students who complete the course in floriculture are fitted primarily for work in commercial and private estate greenhouse establishments and retail flower stores. After gaining experience, such students may be able to start in business for themselves. With the courses in general horticulture they should also be qualified for positions on private estates, in parks, or in nurseries.

The offices and classrooms of the Department of Floriculture are located in French Hall. Of the two lecture rooms, one will accommodate 40 students, the other 90 students; a laboratory, equipped with slate-covered tables, will accommodate 40 students. In the basement of the building the department has a specially prepared room for bulb storage, a fertilizer and tool room, and a large room for general storage purposes.

The glass area of the department consists of approximately 20,000 square feet, divided as follows: French Hall, range of 7,200 square feet, a durable, practical commercial range, composed of palm and fern, sweet pea, carnation, rose, and students' houses; the old Durfee range of 7,400 square feet, devoted to the growing of decorative, conservatory and bedding plants and chrysanthemums; one house of 3,200 square feet suitable for propagating work and general plant culture; and approximately 2,200 square feet in cold frames and hotbeds.

In addition, the department has 2 acres of land used for the summer culture of carnations, gladioli, dahlias, sweet peas and bedding plants; a perennial garden, an annual garden and a rose garden.

Floriculture

First Year

Fall Term	Winter Term	Spring Term
Agronomy S-1 (Soil Management) Floriculture S-1 (Garden Flowers and Bedding Plants) Pomology S-7 (General Pomology) Vegetable Gardening S-1 (Garden Farming) Tractor Practice **Electives** English S-1	Agricultural Engineering S-4 Agricultural Engineering S-7 Agronomy S-2 (Manures and Fertilizers) Business Law S-1 Floriculture S-2 (Greenhouse Construction and Management) Horticulture S-1 (Plant Propagation) Teaming and Harnessing	Six months' farm placement training

Second Year

Fall Term	Winter Term	Spring Term
Floriculture S-3 (Commercial Floriculture)	Floriculture S-4 (Commercial Floriculture)	Floriculture S-5 (Conservatory Plants)
Floriculture S-6 (Floral Arrangement)	Horticulture S-2 (Plant Materials)	Floriculture S-7 (Uses of Herbaceous Plants)
Horticulture S-12 (Care of Plant Materials)	Rural Sociology S-1 (Social and Economic Problems)	Horticulture S-3 (Plant Materials)
Electives	Vegetable Gardening S-4 (Vegetable Forcing)	Horticulture S-8 (Construction and Maintenance)
Entomology S-1 (Beekeeping)		**Electives**
Motors S-2		English S-3
		Entomology S-2

Floriculture S-1. (Garden Flowers and Bedding Plants.) I.
This course is intended for students who will take up private estate work or who will specialize in floriculture. It will include a study of the annuals, biennials, herbaceous perennials, and bedding plants which are commonly used in commercial floriculture and in private estate work. Methods of propagation, culture and uses will be considered. Laboratory exercises will include work in propagation, planting, study of materials, and planning of beds and borders.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Floriculture S-2. (Greenhouse Construction, Heating and Management.) II.

This course will take up the origin, growth, and importance of the floriculture industry; development of the greenhouse; types of houses and construction; methods of greenhouse heating; general principles of greenhouse management; including soils and their preparation, fertilizers, watering, ventilation, and fumigation; methods of propagation for plants grown under glass. Trips are taken to visit greenhouse establishments in the vicinity of Amherst at a total approximate cost of two dollars. Textbook: White's "Principles of Floriculture."
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Floriculture S-3. (Commercial Floriculture.) I.

Courses S-3 and S-4 will be devoted primarily to a consideration of the important commercial crops. Special attention wlil be given to the culture (under glass) of roses, carnations, chrysanthemums, violets, and sweet peas. Other cutflower crops and various potted plants will also be considered. All members of the class are required to take a one-day trip to visit a large commercial greenhouse establishment at an approximate cost of five dollars each. Textbooks required during the two courses will be: Holmes, "Commercial Rose Culture"; and Smith, "Chrysanthemum Manual."
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Floriculture S-4. (Commercial Floriculture.) II.

A continuation of Floriculture S-3.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Floriculture S-5. (Conservatory Plants.) III.

A study of the plants, both foliage and flowering, which are used in conservatories and in decorative work. Methods of propagation, culture, uses, and identification of plants will be included in the work. Trips are taken to visit the conservatories at Smith and Mount Holyoke colleges at slight expense.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Floriculture S-6. (Floral Arrangement.) I.

A study of the principles underlying the use of flowers in funeral designs and sprays, table decorations, corsages, vase, bowl and basket arrangements; decorations for public functions; study of color with regard to such work. Limited to students who are majoring in floriculture. Textbooks: White, "Principles of Flower Arrangement"; Harry, "Manual of Floral Designing".
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Floriculture S-7. (The Use of Herbaceous Plants.) III.

This course is a continuation of Floriculture S-1 and is intended for students specializing in floriculture and general horticulture. It provides opportunity for a more detailed study of many of the plants considered in the preceding course, with especial emphasis on their uses in gardens and in other types of landscape planting. Lectures, assigned readings, study and identification of plants, planning of borders and gardens.
3 class hours and 1 4-hour laboratory period a week. Credits, 5.

Note.—Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

GENERAL HORTICULTURE

The object of this course is to train men for positions as superintendents or foremen on parks or on private estates, or as foremen for landscape gardeners, or for private practice in horticulture service, including so-called tree surgery, city forestry and golf grounds.

Ample classrooms and laboratories with necessary equipment are provided for all work that must necessarily be done indoors. The extensive college campus with its stretches of lawn, its plantings of trees, shrubs, and vines, its drives and walks, furnishes an outdoor laboratory where the student will be brought into personal relation with problems comparable in every way with those that arise in the management of a park, private estate, etc. Work with various types of horse power, motor power and hand machinery and implements will give him practical knowledge of their use, care, and application. A growing nursery furnishes opportunity for the propagation and culture of those plants used in ornamenting grounds, the transplanting of these about the grounds in compliance with prepared landscape plans, and their subsequent care, including proper methods of pruning.

Horticulture

First Year

Fall Term	Winter Term	Spring Term
Agronomy S-1 (Soil Management) Floriculture S-1 (Garden Flowers and Bedding Plants) Pomology S-7 (General Course) Vegetable Gardening S-1 Tractor Practice **Electives** English S-1	Agronomy S-2 (Manures and Fertilizers) Applied Mathematics S-1 Business Law S-1 Horticulture S-1 (Plant Propagation) Motors S-2 Teaming and Harnessing	Six months' farm placement training

Second Year

Fall Term	Winter Term	Spring Term
Horticulture S-4 (Principles of Plane Surveying) Horticulture S-12 (Care of Plant Materials) Pomology S-8 (Small Fruits) **Electives** Horticulture S-7 (Park and Estate Maintenance) Horticulture S-9 (Golf Course Maintenance)	Forestry S-1 (Woodlot Management) Horticulture S-2 (Plant Materials) Horticulture S-5 (Drawing and Mapping) Horticulture S-13 (Plant Breeding)	Floriculture S-7 (The Use of Herbaceous Plants) Horticulture S-3 (Plant Materials) Horticulture S-6 (Surveying and Plan Making) **Electives** English S-3 Horticulture S-8 (Construction and Maintenance) Horticulture S-11 (Varieties of Greens, Grasses and Their Culture)

Horticulture S-1. (Plant Propagation.) II.

This course sets forth the principal and best methods used in reproducing and increasing the number of those plants cultivated in the various branches of horticulture.
4 class hours and 1 2-hour laboratory period a week. Credits, 5.

Horticulture S-2. (Plant Materials.) II.

The object of this course is to learn to know the trees, shrubs and vines used in ornamental plantings. Special consideration will be given to their individual characteristics as indicated in their fruits, dormant twigs and habits of growth.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Horticulture S-3. (Plant Materials.) III.

A continuation of Horticulture S-2 giving special attention to the foliage characters of evergreens; also a study of the association of various species of plant materials in group plantings.
3 class hours and 1 4-hour laboratory period a week. Credits, 5.

Horticulture S-4. (Principles of Plane Surveying.) I.

Outdoor practice in the use of simple surveying instruments, as tapes, compasses and levels used in the measurement of land surfaces. Lectures will include explanation of construction and theory of instruments.
3 class hours and 1 4-hour laboratory period a week. Credits, 5.

Horticulture S-5. (Drawing and Mapping.) II.

This course deals with practice in elementary drafting, using various types of instruments and materials. Use will be made of the notes taken in Horticulture S-4, in the study of contour maps, grading plans, house lots and gardening problems. Practice will be given in the reading and interpretation of typical maps and plans.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Horticulture S-6. (Surveying and Plan Making.) III.

In this course there will be an application of the methods studied in Horticulture S-4 and S-5 to the mapping of small areas, house lots, garden and park areas, road and walk construction, staking out areas from plans, grading work and simple garden construction problems.
3 class hours and 1 4-hour laboratory period a week. Credits, 5.

Horticulture S-7. (Park and Estate Maintenance.) I.

The work of this term will deal with construction and maintenance of roads and walks, especially such roads as are typical to parks and estates, proper foundations and drainage being emphasized; systems of cost keeping for parks and estates and actual cost records analyzed; relationship between superintendent and laborer; and the entire problem of lawn grass seed, illustrated by growing plots of the more common varieties. Throughout the term there will be laboratory exercises pertinent to the typical fall problems.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Horticulture S-8. (Construction and Maintenance.) III.

In addition to the routine spring problems special emphasis will be made upon the proper cultural methods for lawn building and maintenance. A careful study of all equipment will be made this term.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Horticulture S-9. (Golf-Course Maintenance.) I.

While this course will not teach golf-course designing, the fundamentals of good designs will be carefully studied. Fall maintenance problems will be practiced and studied.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Horticulture S-11. (Varieties of Greens, Grasses and their Culture.) III.

The identification of grasses in turf will be required. The effects of fertilizers on various grasses studied and fertilizer method practiced. Two putting greens will be put into playing condition and maintained. Two large demonstration plots will be used in connection with this course.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Horticulture S-12. (Care of Plant Materials.) I.

This course deals with the care of woody ornamental plants under the following heads; planting, pruning, maintenance of soil fertility, winter protection and tree-surgery.
3 class hours and 1 4-hour laboratory period a week. Credits, 5.

Horticulture S-13. (Plant Breeding.) II.

This course considers the origin of cultivated plants, the problems and methods of the plant breeder in the improvement of horticultural varieties, and some of the basic principles of inheritance on which plant improvement is based.
5 class hours a week. Credits, 5.

Excursions.

For Horticulture S-7 a one-day excursion to estates in Berkshire County. Estimated cost $5.00.

For Horticulture S-11 a two-day excursion to the eastern part of the state visiting golf courses and greenskeepers. Estimated cost $15.00.

These excursions will be required.

Note.—Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

POMOLOGY

This course is arranged to give the student a sound practical knowledge of fruit growing and allied subjects. Graduates who are capable and experienced have advanced rapidly to positions of responsibility in some of the larger orchards of New England, and the demand is active for good men in that field.

Some graduates of this course have gone into business for themselves, establishing successful orchards of their own, or pruning, spraying and otherwise caring for a number of small orchards, the owners of which are not prepared to do their own work. Still others are packing house foremen or are engaged in some other marketing activity. The fruit-growing industry of New England is developing rapidly and the opportunities are excellent for good men who are well trained.

Practical work in the orchards under expert supervision is emphasized where possible. It is intended to familiarize students with the best methods that have been devised by experiment stations and leading fruit growers for the production and marketing of high quality fruits under New England conditions. The Department of Pomology has about fifty acres of fruits easily accessible from the classroom, and the orchards are used freely for purposes of instruction. All the common tree fruits and small fruits are grown here on a commercial scale. Many experiments and demonstrations are in progress in the plantations, offering an exceptional opportunity to the student.

A good equipment is maintained of the principal types of orchard tools and machines. Such implements as sprayers, nozzles, pruning saws, pruning shears, ladders and cultivators are available in great variety for study and trial by students.

Pomology

First Year

Fall Term

Agronomy S-1 (Soil Management)
Floriculture S-1 (Garden Flowers and Bedding Plants)
Pomology S-1 (Orchard Production)
Vegetable Gardening S-1
Tractor Practice

Electives

English S-1

Winter Term

Agricultural Engineering S-4
Agricultural Engineering S-7
Agronomy S-2 (Manures and Fertilizers)
Business Law S-1
Horticulture S-1 (Plant Propagation)
Pomology S-2 (Orchard and Vineyard Pruning)
Teaming and Harnessing)

Spring Term

Six months' farm placement training

Second Year

Fall Term

Entomology S-1 (Beekeeping)
Horticultural Manufactures S-1
Pomology S-3 (Harvesting and Marketing)
Pomology S-4 (Fruit Varieties)

Electives

Motors S-2

Winter Term

Agricultural Economics S-1
Pomology S-9 (Problems in Orchard Management)
Rural Sociology S-1

Electives

Animal Husbandry S-6 (General)
Horticultural Manufactures S-2
Poultry S-6 (General)

Spring Term

Entomology S-2 (Beekeeping)
Farm Management S-1
Pomology S-5 (Spraying)
Pomology S-6 (Small Fruits)

Electives

Agronomy S-3 (Crops)
English S-3
Horticulture Manufactures S-3

Pomology S-1. (Orchard Production.) I.

This course covers the planting and development of young orchards and the management of bearing plantations to produce high-grade fruit. Sites and soils for each of the tree fruits are discussed and the preferences of certain varieties for particular types of soils are studied, to guard against serious mistakes in planting. The best methods are considered for laying out orchards and for setting trees to insure a proper start. The handling of young trees to bring them into early profitable bearing is given special attention.

The culture of bearing plantations is studied in detail to give an understanding of the factors that influence yields and quality of fruit. Methods of soil management are discussed with their adaptation to common soil types and with reference to their advantages and limitations. The experimental plots afford exceptional opportunities to study cultural methods and many subjects are discussed in the orchards.

5 class hours a week. Credits, 5.

Pomology S-2. (Orchard and Vineyard Pruning.) II.

Fruit plantations may be damaged more by unintelligent pruning than by mismanagement in any other single operation. If the orchardist does not know that apple trees bear on spurs, he is very likely to cut them off in pruning, and so reduce his chances for a crop. If he is ignorant of the fact that the peach bears on last year's wood, he may remove most of this wood, and incidentally most of his crop. This course aims to give the student a thorough training in the theory of pruning and the methods of bearing of the different fruits.

At the same time, every student is required to prune in the college orchards and vineyards until he becomes reasonably proficient with each kind of fruit.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Pomology S-3. (Harvesting, Packing, Storing, Marketing.) I.

Handling the crop to the best advantage is one of the most important things in successful fruit growing and one which too often is badly managed because the fundamental principles are not understood. The proper time for harvesting is discussed in this course as well as the most satisfactory methods to insure a maximum storage season.

Particular attention is given to packing apples in boxes and barrels, and practice is continued under supervision until the principles are mastered. Many other packages are packed and studied also in relation to the movement of the New England apple crop.

The principles of common and refrigerated storage are considered in detail and storage house construction under New England conditions is discussed, with a critical examination of several storages in use on or near the campus.

The competitive position of New England in the apple market is studied in relation to market demands and attention is given to export markets and to cities outside of New England. Modern methods of marketing are considered with special reference to developing local markets and to co-operation in handling New England apples.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Pomology S-4. (Fruit Varieties.) I.

One of the most prolific causes of failure in the fruit business is the growing of wrong varieties; varieties requiring a dry soil are set in a wet soil; tender varieties are set in a wet soil or where only hardy ones should be used; quality, productiveness, and season of ripening are ignored; and varieties are set which might be excellent in Ohio or Virginia or Missouri, but which cannot be grown profitably in Massachusetts.

This course aims to lay the foundation for a better state of things. The student is given a thorough drill on varieties of different fruits and has an opportunity to test personally many of the leading varieties, especially of apples.

5 class hours a week. Credits, 5.

Pomology S-5. (Spraying.) III.

In this course a careful study is made of modern methods of spraying. All the principal spray materials are studied, and the student is given practice in their preparation for use and in applying them to the orchard.

The department is well equipped with modern spraying apparatus, from bucket pumps to large power outfits, and students are required to study the construction of these pumps, and to operate them in the orchards.

Spraying is very properly regarded as one of the most important operations in connection with growing fruit, and it is the aim of this course to train students to recognize the work of our common orchard pests, to prepare the proper materials for their control, and to apply them efficiently.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Pomology S-6. (Small Fruits.) III.

While orcharding will always be the leading phase of fruit growing in Massachusetts, there are many unusual opportunities for success in growing the various small fruits. This course deal with the problems of establishing and handling successfully plantations of strawberries, raspberries, blackberries, currants, gooseberries, and grapes, including such questions as the choice of varieties; the best types of soils; laying off and setting the plantation; the proper fertilization; and methods of pruning and training. The college has large plantations of most of these fruits, so the student has ample opportunity for a wide range of practical work. The aim is to make the course of the utmost practical value, as well as to give the scientific principles on which practices are based. Each student must be prepared to take a trip to one of the fruit sections of the northeastern United States, at a cost of $15 to $25.

5 class hours a week. Credits, 5.

Pruning Raspberries

Learning to Spray

Pomology S-7. (General Course.) I, II.

This course is intended to meet the needs of students in the Animal Husbandry and Poultry majors who cannot devote more than one term to the subject of Pomology. It deals with the practical side of the growing and marketing of fruits. Special attention is given to such questions as selection of site for the plantation, choice of varieties, grafting and budding, spraying, pruning, cultivation and cover crops, fertilizing the fruit plantation, packing and marketing. 3 lectures and 2 2-hour laboratory periods a week. Credits, 5.

Pomology S-8. (Small Fruits.) I.

This course is designed for those students who are not majoring in Pomology but wish to make a special study of the various small fruits.

In a section like New England, with its excellent local markets, there are many farms and some whole sections where some of the small fruits may be made a very profitable part of the farm operations.

The course will include a detailed study of strawberries, raspberries, blackberries, currants and grapes, dealing with all the essential problems in establishing and maintaining such plantations, including such questions as the choice of site, selection of varieties, setting the plants, fertilizing, pruning, spraying, culture, harvesting and marketing.

The Pomology Department has commercial plantations of most of these fruits where the student will be given actual practice in all of the operations studied, so that he may become familiar with the practical details of handling such fruits. 5 class hours a week. Credits, 5.

Pomology S-9. (Problems in Orchard Management.) II.

This course provides an opportunity to focus placement training experiences and information acquired in previous courses on the major problems of the New England fruit grower. It is the aim of the course to familiarize the student with conditions under which fruit must be grown here, with current thought on the more important recent developments, and with the sweeping adjustments which are being made in the fruit industry of the Northeastern States. 3 class hours a week. Credits, 3.

Note.—Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

VEGETABLE GARDENING

The business of vegetable growing is one of the leading types of agriculture in Massachusetts. Middlesex County is surpassed in the value of vegetables grown for sale by only four other counties in the United States. The value of vegetables grown for home use in Massachusetts is more per farm than in any other State in this country. The vegetable greenhouse district around Boston is one of the largest in the United States, and the only district growing head lettuce under glass. The Massachusetts markets for vegetables are considered by many to be among the best, for we are further removed from the large vegetable trucking sections than other large centers of population, while our markets demand high-quality vegetables.

The two-year course in Vegetable Gardening is designed to prepare men to go into business for themselves as market gardeners, truck farmers, and greenhouse vegetable growers. For those whose principal interest may lie in other fields of agriculture the course has much to offer along the lines of special crops, often spoken of as cash crops. For those who wish to work for someone else this course offers training such that its graduates are being placed in responsible positions with commercial vegetable growers, seed growers, and on private estates.

Vegetable Gardening

First Year

Fall Term

Agronomy S-1 (Soil Management)
Floriculture S-1 (Garden Flowers and Bedding Plants)
Pomology S-1 (Orchard Production)
Vegetable Gardening S-1
Tractor Practice

Electives

English S-1

Winter Term

Agricultural Engineering S-4
Agricultural Engineering S-7
Agronomy S-2 (Manures and Fertilizers)
Business Law S-1
Pomology S-2 (Orchard and Vineyard Pruning)
Vegetable Gardening S-2
Teaming and Harnessing

Spring Term

Six months' farm placement training

Second Year

Fall Term

Horticultural Manufactures S-1
Pomology S-3 (Harvesting and Marketing)
Pomology S-4 (Fruit Varieties)
Vegetable Gardening S-3

Electives

Entomology S-1 (Beekeeping)
Motors S-2

Winter Term

Agricultural Economics S-1
Rural Sociology S-1
Vegetable Gardening S-4

Electives

Horticultural Manufactures S-2
Poultry S-6 (General)

Spring Term

Pomology S-5
Pomology S-6
Vegetable Gardening S-7

Electives

Entomology S-2 (Beekeeping)
English S-3
Horticultural Manufactures S-3

The business of vegetable gardening may be undertaken with a limited outlay of capital, for the returns on the capital invested are quickly secured. Some vegetable crops mature in a very few weeks, thus enabling one to turn over his capital from one to three times per season. The nature of this business is such that one locates as near the market as possible, and because of the growth of our cities, vegetable growers, as a group, have profited much by an increase in land values.

The Vegetable Gardening Department has 10 acres of land, 3,500 square feet of greenhouse space, and 500 linear feet of hotbeds and cold frames. These are used to give the student thorough practical training in the fundamentals of vegetable growing, plant production, and vegetable forcing. The office, classroom and laboratory are located in French Hall.

Vegetable Gardening S-1. (Principles of Vegetable Growing.) I.

Cultural practices employed in the growing of vegetables vary widely from place to place but the fundamental principles underlying these practices are everywhere the same. The lecture work in this course consists of a study of these principles with illustrations of their applications from a theoretical standpoint. The laboratory work consists of a study of the applications of scientific and practical knowledge to vegetable culture.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Vegetable Gardening S-2. (Principles of Vegetable Growing.) II.

The lecture work in this course is a continuation of that in Vegetable Gardening S-1. The laboratory work consists of a series of experiments on plant behavior. Problems on water requirements, plant nutrition, and the effects of various other factors on crop growth and yield are studied at first hand.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Vegetable Gardening S-3. (Systematic Vegetable Gardening.) I.

This course is designed to acquaint the student with the identification, nomenclature and classification of the standard types and varieties of vegetables; seed production and variety improvement work; sources of obtaining seed; exhibiting and judging of vegetables.
2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

Vegetable Gardening S-4. (Vegetable Forcing.) II.

A study of (1) the geographical distribution of the greenhouse industry, and the part this phase of vegetable production plays in supplying our markets with fresh vegetables; (2) the underlying principles of plant production under glass and their practical applications; economic factors in harvesting and marketing of greenhouse produce.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Vegetable Gardening S-6. (Principles of Vegetable Growing.) III.

This course is similar to course S-1 except that it is more comprehensive. The practical studies are limited chiefly to the crops with which this group of students is likely to have to deal.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Vegetable Gardening S-7. (Principles of Vegetable Growing.) III.

A knowledge of the principles underlying the commercial vegetable growers' problems is necessary before these problems may be satisfactorily solved. Weekly assignments dealing with specific problems as encountered in the vegetable growing business are worked out by the students. Organized trips through the Connecticut Valley and one trip through the market gardening section near Boston are required. This latter trip requires about three days and costs each student approximately fifteen dollars.
3 class hours and 2 2-hour outside laboratory periods a week. Credits, 5.

GENERAL COURSES FOR WOMEN

There was offered in the fall of 1922, for the first time, a general course for those young women who do not want to specialize in any one branch of agriculture, but who do want preparation for rural life. This course includes such agricultural and home economic courses as the country girl would be most likely to use, both for profit and for pleasure. This course should appeal to many young women whose home is on a farm or in a small town; or those who hope some time to live in the country.

General Course for Women

First Year

Fall Term	Winter Term	Spring Term
Agricultural Opportunities for Women S-1 Agronomy S-1 (Soil Management) Floriculture S-1 Home Economics S-1 Physical Education S-1 **Electives** English S-1	Agronomy S-2 (Manures and Fertilizers) Bacteriology S-1 (Bacteriology and Rural Hygiene) Home Economics S-2 Home Economics S-3 Horticulture S-1 Physical Education S-2	Six months' farm placement training

Second Year

Fall Term	Winter Term	Spring Term
Agricultural Engineering S-8 (Household Mechanics) Dairy S-1 (General) Horticultural Manufactures S-1 **Electives** Entomology S-1 (Beekeeping) Physical Education S-3	Animal Husbandry S-6 (General) Home Economics S-4 Poultry S-6 (General) Pomology S-7 (General) **Electives** Agricultural Economics S-1 Horticultural Manufactures S-2 Physical Education S-4 Rural Sociology S-1	Home Economics S-5 (House Furnishing) Horticultural Manufactures S-3 Poultry S-5 Vegetable Gardening S-6 (General) **Electives** English S-3 Entomology S-2 (Beekeeping)

RELATED SUBJECTS IN OTHER DEPARTMENTS

Agricultural Economics S-1. (Marketing.) II.

The purpose of this course is to present the business side, or economics of agriculture. It is based upon the principle that goods are made to sell, and that the real object of production is adequate money return.

The problem of the marketing of farm products is treated in a practical manner. The aim of the course is to co-ordinate the marketing practice with which the student has already become familiar during his placement training, or has used on his home farm, with the accepted principles and practices of farm marketing. Some of the topics discussed are marketing as a part of production; the principles of marketing; the methods of wholesale distribution; the methods of sale; the prices of farm products; government aids in marketing; co-operative buying and selling; the successful advertising of farm products; the principles of farm credit. Each student will be required to select some product of major interest to him and make a careful study of its production, handling and marketing.

A two-day marketing trip to the Boston market is required for the purpose of studying at first hand the methods of handling products on the wholesale market; the cold storage system; etc. The cost averages from $10 to $15.

5 class hours a week. Credits, 5.

Department of Agricultural Economics.

Agricultural Engineering S-1. (Farm Engineering.) I.

This course is intended to familiarize the student with the various types of farm implements, to teach him their operation and care, and give practice in the adjustment and repair of the mechanical equipment on the farm.

The various types of field implements are studied, and emphasis is laid on the selection of implements suited to New England conditions. The adjustment of machines is discussed and the student is given practice in setting machines for different field conditions.

Part of the course is given over to the repair of farm equipment. In this work part of the time is given over to blacksmithing and the balance to such exercise as soldering, babbitting and fitting bearings, lining up shafting, pipe fitting threading bolts and nuts, and practice in tying knots and splicing rope. Farm implements are brought in and overhauled to give practical work in this line. In the limited time available it is not expected to make a blacksmith or mechanic out of the student, but it is hoped that the student will learn to know the tools used and get sufficient practice in their use so that he can make repairs on his own equipment.

Part of the course is given over to the study of water supply systems, including pumps, rams, and complete power systems. Farm-lighting plants are also studied, attention being given to selection, as well as care and operation. The principles underlying the practice of farm drainage are discussed, and practice is given in the use of simple leveling instruments for the purpose of accurately grading tile drainage ditches.

2 lectures and 3 2-hour laboratory periods a week. Credits, 5.

Department of Agricultural Engineering.

Agricultural Engineering S-2. (Farm Motors.) I, II.

This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles, and tractors. Special attention is given to overhauling and repairing.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Department of Agricultural Engineering.

Agricultural Engineering S-3. (Carpentry.) I.

This course gives practice in the care and use of carpenters' tools through bench work, repair of farm equipment, and building construction. Small buildings are erected by the students to give practice in all the phases of house construction. Practice is given in the building of forms and in the mixing and placing of concrete. (Must be taken with Agricultural Engineering S-7.)
2 2-hour laboratory periods a week. Credits, 2.
Department of Agricultural Engineering.

Agricultural Engineering S-4. (Repair of Farm Equipment.) II.

The object of this course is to give practice in the handling of tools, which will help in the repair of farm machines and miscellaneous farm equipment. Practice is given in forging, including drawing and shaping iron and steel, welding and tempering edged tools, and general blacksmith's repairing. Exercises also include pipe fitting, soldering, splicing rope, belt lacing, and babbitting and adjusting bearings. Practice is given in the use of machinists' tools, such as cold chisel, file, taps and dies, drill press, and lathe. (Must be taken with Agricultural Engineering S-7.)
2 2-hour laboratory periods a week. Credits, 2.
Department of Agricultural Engineering.

Agricultural Engineering S-5. (Dairy Mechanics.) III.

This course is planned for men who are fitting themselves to take charge of dairy plants or allied lines of work. A study of steam boilers, steam engines, steam turbines, pumps, steam traps, line shafts, belting, electric motors, milking machines, and refrigeration plants.
3 class hours and 1 4-hour laboratory period a week. Credits, 5.
Department of Agricultural Engineering.

Agricultural Engineering S-7. (Farm Structures.) I, II.

A study of the building materials commonly used in farm construction; details of construction and simple structural mechanics; the principle of design of such farm buildings as the dairy stable, hog house, horse barn, general purpose barn, poultry house, fruit and vegetable storage buildings, etc.

In the drafting room practice will be given in the use of drawing instruments, and instruction given in the fundamentals of drawing. Each student will have opportunity to design in complete detail one of the major farm buildings in which he is particularly interested. (Must be taken with Agricultural Engineering S-3 or S-4.)
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.
Department of Agricultural Engineering.

Agricultural Engineering S-8. (Household Mechanics.) I.

A study of house planning, heating, lighting, water supply, and sewage disposal. Practice will be given in the care and repair of household appliances.
2 class hours and 3 2-hour laboratory periods a week. Credits, 5.
Department of Agricultural Engineering.

Agricultural Opportunities for Women S-1. I.

An outline of the occupational progress of women with special attention to the vocational opportunities for women in agriculture and related fields.
2 class hours a week. Credits, 2.
Miss Hamlin.

Agronomy S-1. (Soil Management.) I.

Every agricultural interest is vitally concerned with the soil, its adaptations and its management for plant production. This course treats of the selection of suitable soils for the special purposes of agriculture, horticulture and floriculture, and with the management of soils with regard to moisture control, tillage, organic matter, soil bacteria, and soil acidity.

The laboratory work gives training in the use and interpretation of the maps of the U. S. Soil Survey and in tests of soil texture, organic matter and acidity. Practical field work will be given in judging the crop adaptation and value of soils, and field demonstration of the use of tillage tools on the college farm.

As a field project the student will be required to make a study of some farm, nursery or florist's plant. This project includes a survey of the soil conditions, and methods of soil and crop management, with analysis of the relation of the soil to the enterprise as a whole.

3 class hours and 1 3-hour laboratory period a week. Credits, 4.

Agronomy Department.

Agronomy S-2. (Manures and Fertilizers.) II.

This course deals with the storage and handling of manure and its use in crop production, with the selection and use of lime materials, and with the economical purchase and use of commercial fertilizers. The interpretation of fertilizer analysis and guarantee will be studied. Special attention will be given to the newer concentrated fertilizer materials and to those produced from atmospheric nitrogen.

The laboratory work will give practice in identification of fertilizer materials, and in the calculation of fertilizer formulas, and preparation of fertilizer mixtures. A demonstration of the effect of the different fertilizer elements on plant growth will be carried out by the students in the department greenhouse.

2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Agronomy Department.

Agronomy S-3. (Field Crops.) III.

This course is planned to acquaint the student with the best and most successful practices of production and harvesting of field crops. Problems usually arising in connection with these practices will be studied. Special attention will be given to the hay crop, corn, potatoes, roots, and pastures. Field work with growing crops and laboratory work in the identification of seeds of grasses, clovers, weeds and small grains, in tests of purity and germination of seeds and judging of different types of corn and potatoes will be given. Before completing the course the student will be expected to know how to select varieties. test seed, prepare the soil, select and apply fertilizer, plant, cultivate, harvest and store the field crops important in Massachusetts.

2 class hours, and 3 2-hour laboratory periods. Credits, 5.

Agronomy Department.

Applied Mathematics S-1. II.

A careful study of fractions, decimals, percentage, ratio and proportions, powers, roots, denominate numbers and elementary mensuration. Especial attention will be given to methods of computation and to practical applications to work given in the Horticultural Department.

5 class hours a week. Credits, 5.

Mathematics Department.

Bacteriology S-1. (Bacteriology and Rural Hygiene.) II.

In this course bacteria are studied as to types and reproduction, together with methods of dissemination, followed by discussions on these micro-organisms as related to man and his environment.

The work of the course will be divided into sections having to do with the study of the sanitary production and handling of milk, water and food and into a section having to do with the study of bacteria in terms of diseases of man and animal and the relationship to environmental factors such as air, humidity, food and personal hygiene. The sanitary production and distribution of milk is an important problem to a community and under the discussions pertaining to milk are to be considered various avenues of infections, methods of maintaining a sanitary production and how to establish suitable means for checking anything pertaining to contamination. Since water supplies are of special importance to man the construction of wells, cisterns, etc. will be considered briefly followed by discussions relative to contaminations and their consequences. The proper disposal of sewage offers a rural problem of no small importance. Therefore, in this course will be discussed construction and installation of septic tanks, together with the study of some of the bacteriological work to establish their efficiency. Work has been planned in this course to present some of the problems pertaining to the production and distribution of foods, special attention being given to preservation methods.

In the later part of this course will be presented some problems associated with the disease of man and animal. Various disinfectants will be considered and some time will be devoted to a discussion on the use and preparation of serums for fighting disease.

The purpose of this course will be to acquaint the student with the importance of bacteria and the subject of bacteriology in agriculture, industry, the arts and the relationship of this subject to the health of man and animals.

5 class hours a week. Credits, 5.

Bacteriology Department.

Bacteriology S-2. (Dairy Bacteriology.) I.

Bacteria and other micro-organisms are the responsible agents for changes which occur in milk, and for the contagion which sometimes causes disease. They are found in milk at times when leaving the udder, they get in with the dust and dirt while milking and they adhere to the dairy utensils which carry them over from one milking to the next. From the cow to the consumer there is the constant presence of these micro-organisms to contend with, on the one hand, and to foster on the other.

Many of these changes occurring in milk are undesirable, such as ropy milk, sour milk, bitter milk, tainted milk, etc. Many of these changes are encouraged as the ripening of cream for butter, of milk for cheese, of milks for milk drinks. The former are fought, the latter fostered.

Micro-organisms of typhoid fever, scarlet fever, diphtheria and other diseases find their way by means of milk to the consumer and produce epidemic forms of these diseases.

Much time is spent in making plate counts and interpreting results. The different bacteriological tests are studied, such as Breed and Methylene Blue. The proper use of these methods will quickly enable one to locate the source of trouble and check any further continuance.

It is evident therefore, that to handle milk and milk products safely it is desirable to know something of the agents which are the source of so much attention in the dairy. This indicates the nature of the substance of this course. This course is required of all students who elect dairying as one of their special lines of work.

1 4-hour and 2 3-hour laboratory periods a week. Credits, 5.

Bacteriology Department.

Business Law S-1. II.

Required for freshmen. To consist of a particular study of the contract, drawing, reading and interpreting the same; the sale; and problem work. Other branches of the law such as deeds, mortgages, corporations, partnerships,

commercial paper, torts and personal rights explained and presented by lectures during the course. Particular stress is placed on the reasoning process.
5 hours a week. Credits, 5.

English Composition S-1. I.

Required for freshmen with less than two full years of high school preparation, or its equivalent; and elective for others. To consist of directed readings (one book or its equivalent per week); essay writing (one short essay, book report personal or business letter, or writing of a similar nature per week); and an oral presentation (a five-minute address or talk on an assigned topic to be prepared for each week, and as many heard as time permits).
3 hours a week. Credits, 3.

English Composition S-3. III.

Required of seniors interested in dramatic presentation and elective for the rest. This course is in continuation of the freshman course; but lays particular stress on the drama and dramatic presentation. (All dramatic presentation endeavored by the Two-Year Course, or other short courses to be under the direction of the instructor in English Composition.)
3 hours a week. Credits, 3.

Entomology S-1. (Beekeeping.) I.

This course and the one following comprise a general consideration of the biology of the honey bee and the elements of practical beekeeping. This includes the life history of the individuals and their relation to the colony, their structure, normal behavior and instincts which form the basis of practical beekeeping. The best methods of management, which will provide more productive colonies for greenhouse and orchard pollination, and honey production are studied. Consideration is given to the problems of marketing and control of bee disease. As far as possible, the work is made individual in the construction of equipment and manipulation of bees.

The problems of fall management and wintering are made the basis of this course while those concerning spring and summer management are covered in Entomology S-2.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.
Entomology Department.

Entomology S-2. (Beekeeping.) III.

This course is a continuation of Entomology S-1 and is required of students taking that course.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.
Entomology Department.

Farm Management S-1. (Farm Management and Accounts.) II, III.

The work in this course involves a study of farm records and accounts; cost of producing and prices of farm products; uses of capital and credit; types of farming, selection of crop and livestock enterprises; size, diversity and production as related to the successful farm business; farm layout and arrangement; economic use of labor, power and equipment; detailed analyses of both successful and unsuccessful farms, how the farmer should make adjustments to meet economic changes; and finally, a bringing together of the information gained and applying it to the successful organization of a farm business.

Actual farm records are used to illustrate the above points. The entire course is made as applicable and practical as possible. Farm experience and the keeping of a personal expense account during the period of placement training are prerequisites of this course.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.
Farm Management Department.

Forestry S-1. (Woodlot Management.) II.

A course in tending, harvesting, marketing, and renewing the forest crop, with particular reference to the problems of the farm woodlot. The instruction is mainly practical, and is conducted in the field, with a minimum of bookwork; but there is a constant emphasis upon the development of keen and imaginative observation, and the acquisition of the conservationist point of view. Opportunities for field work are varied and extensive. There are woodlots of several types on or near the campus, and students have the fullest use of the Mt. Toby Demonstration Forest, a 750-acre tract 7 miles distant, belonging to the college and managed by the Forestry Department.

2 class hours and 1 4-hour and 1 2-hour field periods a week. Credits, 5.

Forestry Department.

Home Economics S-1. (Clothing.) I.

This course is based on the need of good judgment in the selection of clothing, both ready made and home made. It includes a study of fabrics, their cost, value, manufacture and suitable use; of ready-made and homemade garments; and of design, color and general appropriateness and becomingness of clothing. Some garments are made in the laboratory. One or more trips to textile mills and stores are included in the course.

Estimated cost of materials used in laboratory $5.00-$10.00.

Estimated cost of trips $1.50.

2 class hours and 2 3-hour laboratory periods a week. Credits, 5.

Miss Tucker.

Home Economics S-2. (Foods.) II.

This course aims to teach wise food selection and methods of preparation which are attractive, but which conserve food values. The use of a few basic principles in food preparation and serving, and in meeting nutritional needs will be stressed. Special study will be made of the body needs of persons of different ages and activity, and of the choosing of foods to meet these needs.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

Miss Knowlton.

Home Economics S-3. (Health and Home Nursing.) II.

In this course emphasis is placed upon personal hygiene as a means of maintaining and improving health in the home. This will include ways of living to prevent sickness, the care of the family in case of unavoidable sickness, and the right attitudes toward health.

5 class hours a week. Credits, 5.

Miss Skinner.

Home Economics S-4. (Home Management.) II.

This course includes a study of the organizing and simplifying of methods of housekeeping; standards of living and family expenditures; the use of leisure time; family and community relationships.

5 class hours a week. Credits, 5.

Miss Skinner.

Home Economics S-5. (Home Furnishing.) III.

This course emphasizes the importance of attractive surroundings in creating a happy home life. It aims to develop good judgment and right standards in the selection of home furnishings. The discussions include the basic principles of good design, the use of color, the treatment of walls, floors and windows, and the choice, cost and arrangement of all types of furnishings found in the average home.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Miss Tucker.

Horticultural Manufactures S-1. I.

The utilization of culls and low grades of fruits and vegetables is becoming a more important problem each year. Producers should be able to market their whole crop at a profit. The general problems studied in this course will be: the manufacture of apple products from cull apples; the canning of all fruits and vegetables available at this season, together with the manufacture of their various products, such as jams, jellies, conserves, pickles, etc.

Students will be required to keep accurate costs of materials in all canning and manufacturing operations together with a record of methods used.
2 class hours and 3 2-hour laboratory periods a week. Credits, 5.
Department of Horticultural Manufactures.

Horticultural Manufactures S-2. II.

This is a continuation of Course S-1. The preservation of small fruits together with the manufacture of their products; the evaporation of fruits and vegetables, and the manufacture of fruit syrups are the principal subjects studied. Prerequisite: Horticultural Manufactures S-1.
2 class hours and 3 2-hour laboratory periods a week. Credits, 5.
Department of Horticultural Manufactures.

Horticultural Manufactures S-3. III.

This is a continuation of Horticultural Manufactures S-1 and S-2. The manufacture of maple products, fermented pickles, and the canning of spring vegetables will be the principal subjects studied. Students will be given opportunity to make special studies along the lines of their greatest interest. Prerequisites: Horticultural Manufactures S-1 and S-2.
2 class hours and 3 2-hour laboratory sessions per week. Credits, 5.
Department of Horticultural Manufactures.

Rural Sociology S-1. I and II.

Required for seniors. The first part of the course to deal with the study of the individual and his relationships and conflicts in society. Particular note to be taken of rural society and its problems. The remainder of the term to be taken up with specific problem study, individual topics to be assigned and papers prepared and read in class on the same.
5 class hours a week. Credits, 5.

Veterinary Science S-1. (Animal Sanitary Science.) III.

Conservation of the health of animals is the keystone of successful animal husbandry. This course acquaints students with the essentials upon which the health of animals depends. In order that students may later guard the animals in their charge, attention is given to conditions favoring communicable and non-communicable diseases, and to prophylactic measures.
5 class hours a week. Credits, 5.
Department of Veterinary Science.

PHYSICAL EDUCATION

Women

All women students are required to take physical education throughout the first year and may elect it with credit during the first and second terms of the last year.

Undergraduate women students are required to furnish a physical examination report from their family physician.

Physical Education S-1. I.

This course will include such outdoor sports as soccer, basketball, tennis and hiking
2 class hours a week. Credits, 2.
MRS. HICKS.

Physical Education S-2. II.

This course will include posture exercises, folk dances, and games.
2 class hours a week. Credits, 2.
MRS. HICKS.

Physical Education S-3 and S-4. I-II. (Elective for seniors.) Credits, 2.
MRS. HICKS.

MEN

Required Courses

Physical Education S-1. I. RECREATION.—For freshmen. Outdoor games.
2 laboratory hours a week. Credits, 2.
MR. BALL.

Physical Education S-2. I. RECREATION.—For seniors. Outdoor games.
2 laboratory hours a week. Credits, 2.
MR. BALL.

All undergraduate male students are given a physical examination upon entering.

Students reporting regularly in athletic squads, football, basketball or baseball, are not required to take the above courses.

SHORT COURSES AT THE MASSACHUSETTS AGRICULTURAL COLLEGE

Short courses are based on the idea that the motive which inspires study is the most significant factor in study itself, and that this motive rises when the student himself realizes he faces a problem that calls for a solution. Therefore, there is no age limit. Enrolled in short courses are found the young and the old, the experienced and the inexperienced, the theoretical and the practical. In this grouping there is a value, since students learn from each other as well as from the instructors. Practically all Short Course students intend to make a direct application of the knowledge given. Hence the aim of Short Course work is to offer the largest amount of information and training in agricultural and horticultural lines in the shortest possible time. During the past twenty years Short Courses have served hundreds of students in this Commonwealth, and the demand for these courses in recent years has steadily continued.

THE SUMMER SCHOOL

The college has maintained a Summer School for the past twenty-one years. The Summer Course is intended for high school teachers, teachers of agriculture, instructors in home economics, and for students who wish courses in science, education, and horticulture. The course lasts six weeks, beginning about the first of July and continuing through the month to about the second week in August. All courses offered, if successfully completed, carry collegiate credit or graduate credit.

The following schedule of courses, offered in 1928, indicates the nature of the work:—

- Principals and Methods of Teaching
- History of the Philosophy and Practice in Education
- Educational Psychology
- Secondary Education
- Special Methods in Teaching Vocational Agriculture
- Tests and Measurements
- The Employed Teacher of Agriculture
- Vocational Education
- Clothing
- Foods
- Home Furnishing
- Teaching Home Economics
- Insect Life
- Advanced Entomology
- Botany for the Teacher
- Fresh Water Algae, Fungi, Liverworts, Mosses and Ferns
- Public Health
- Geologic Processes and the Origin of Land Forms
- Animals and Plants of the Past
- Physiological Chemistry
- Garden Flowers and Bedding Plants
- Plant Materials
- Garden Design
- Surveying and Mapping
- College Algebra
- American Literature
- Dramatic Presentation

THE WINTER SCHOOL

The Winter School has been established for a number of years at the college, and has proved to be very popular with farmers, their wives, sons, and daughters, teachers, college graduates, and others. This school begins about the first of January. Instruction was offered last year in—

- Soil Fertility
- Field Crops
- Types and Breeds of Live Stock
- Live Stock Feeding
- Animal Breeding
- Farm Management
- Farm Accounts
- Farm Motors
- Dairy Bacteriology
- Animal Diseases
- Vegetable Gardening
- Poultry Courses:—
  - Incubation, Brooding and Marketing
  - Feeding and Culling
  - Poultry Breeding and Sanitation
  - Poultry Housing, Management and Farm Organization
- Tree Fruits
- Pruning Tree Fruits
- Spraying
- Small Fruits
- Harvesting and Marketing
- Horticultural Manufactures
- Floriculture
- Marketing Farm Products
- Botany
- Entomology
- Rural Sanitary Science and Hygiene
- Agricultural Opportunities for Women
- Food and Nutrition
- Textiles and Clothing
- Health Education
- Home Management
- Dairying
- Greenskeepers Course
- Principles and Methods of Teaching
- Special Methods in Vocational Agricultural Teaching
- Agricultural Teaching Improvement Problems in Massachusetts

A series of special two-week courses in ice-cream making, butter making, milk testing, and market milk are offered. During the two weeks the student devotes all of his time to the work of the special course in which he has enrolled. The instruction lasts throughout the day from 8 to 5. These courses meet a very definite need in the State for those who wish instruction, but who cannot attend for a longer period of time, and who do not wish to take other subjects.

DIRECTORY OF INFORMATION

A. The College.

Those desiring college catalogues, the President's annual report, and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, should address Robert A. Hawley, Secretary, Amherst, Mass.

All questions regarding admission to the college, either to the freshman class or to advanced standing, should be addressed to William L. Machmer, Dean of the College, Amherst, Mass.

B. Experiment Station.

The Experiment Station conducts investigations in as many lines of agricultural science and practice as its funds will permit. It has charge of the inspection of commercial fertilizers, commercial feeding stuffs, and milk-testing apparatus. Branch stations in cranberry and market-garden culture are maintained in other sections of the State.

The station considers the farmers' problems to be its problems, and desires to keep in touch with them.

Requests for bulletins reporting the results of experiments and inspections, and for other information on the work of the station, should be addressed to Fred J. Sievers, Director of the Experiment Station, Amherst Mass.

C. The Graduate School.

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Dr. Henry T. Fernald, Director of the Graduate School, Amherst, Mass.

D. The Extension Service.

Inquiries of a general nature regarding the work of the Extension Service, extension publications, or requests for new lines of work should be addressed to Willard A. Munson, Director of Extension Service, Amherst, Mass.

E. Short Courses.

For information concerning the Short Courses, the Stockbridge School of Agriculture the Ten-Weeks Winter School, the Summer School, write or apply to Roland H. Verbeck, Director of Short Courses, Amherst, Mass.

MASSACHUSETTS AGRICULTURAL COLLEGE

THE TEN WEEKS' WINTER SCHOOL

1929

THE M. A. C. BULLETIN

Amherst, Massachusetts

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Professor of Landscape Gardening, Head of Department, Head of Division of Horticulture	
Winthrop F. Welles, B.S.	Agricultural Education
Professor of Agricultural Education, Head of Department	
Hubert W. Yount, M.S.	Agricultural Economics
Assistant Professor of Agricultural Economics	

THE TEN WEEKS' WINTER SCHOOL

January 2, 1929 to March 15, 1929

The Winter School has been maintained by the college for over twenty years. It meets a definite need in providing instruction for groups of men and women who can most conveniently leave the farm during the winter months. The school closes in time for students to return to take up the spring work.

In addition to the regular Winter School, the attention of the student is directed to the following special schools offered during the winter period:

The Winter Course in Fruit Growing.
The Winter Course for Greenskeepers and Golf Course Foremen.
The Winter Course in Poultry Raising.
The Dairy School.

In order that the Winter School may serve as many people of the Commonwealth as wish to take advantage of it, no entrance requirements have been fixed other than that the student shall be at least eighteen years of age and shall have completed the elementary or common schools. The expenses are very moderate.

The instruction is thorough. The regular faculty teach the Winter School, assisted, if necessary, by additional instructors and lecturers from outside.

There are no required courses except in the special courses or groups listed above. The advice of the faculty in regard to the course may be had, but the students are left free to select the courses in which they are interested.

The college does not guarantee positions, but frequently has calls for capable, energetic men and women with farm experience. Students interested in securing positions should consult the Supervisor of Placement Training early in the winter. Employers who wish to secure the services of reliable men are also advised to take the matter up directly with the Supervisor of Placement Training in the Short Course Office.

Tuition, Fees and Expenses

There is a tuition fee of $10.00 for the full Ten Weeks' Winter School and each student is required to pay to the Treasurer a $5.00 registration fee in addition. There are no laboratory fees in connection with any of the courses. The registration fee and tuition fee, unless sent in advance, must be paid at the time of registration to the Treasurer of the college.

Board may be obtained at the college dining hall for approximately $7.50 a week. Rent for furnished rooms in private houses varies in price from $2.50 to $4 a week for each occupant.

Rooms for women may be secured in private homes. The Short Course Office will be glad to assist students in locating rooms.

Registration

Students will be registered in classes Wednesday, January 2, at the Short Course Office. Classes will begin Thursday, January 3, at 8 o'clock A.M.

Upon arrival the student should report at the office of the Director of Short Courses, located in South College; call Stockbridge 900.

Advanced Registration Required by December 20.

(Small classes may be cancelled)

Because it frequently happens that only a small group registers in a class, the College finds it necessary to require an enrolment of at least six students in a class. Where classes do not reach this figure by December 20, when registration in advance closes, notice will be sent to prospective students indicating such classes cannot be given.

In the special courses: The Winter School in Fruit Growing, The Winter School for Greenskeepers, The Ten Day Dairy Courses, and The Winter Course in Poultry Raising, at least ten students will be required to enroll if the course is given. Be sure and indicate on the application blank in back of catalog what classes or course you desire to attend and send to the College before December 20. Due notice will be given if courses have to be cancelled.

RULES AND REGULATIONS

The choice of subjects is left to the student, but students are advised to elect not less than ten nor more than twenty-five hours per week except when a special school program is taken. All variations from this rule must be approved by the Director of Short Courses.

A class that meets for one hour a day for five days per week is reckoned as five credit hours. A two or three hour laboratory period counts as one class hour.

Information in regard to books used in the various courses will be given by the instructors at the first meeting of the class. The necessary textbooks may be purchased at the Treasurer's office.

As a guide to those who come to the college for the first time, the following extracts are taken from the regular rules of the college:—

The customary high standard of college men in honor, manliness, self-respect and consideration for the rights of others constitutes the standard of student deportment.

It should be understood that the college, acting through its president or any administrative officer designated by him, distinctly reserves the right not only to suspend, but also to name conditions under which students may remain in the institution.

Regularity of attendance and conformity to general college rules are required of all Winter School students.

THE LIBRARY

The College Library occupies the entire building formerly partly occupied by the chapel. It contains more than 81,300 bound volumes and a very large collection of pamphlets, probably twice as numerous, which are of great practical value, being monographs on the technical subjects studied in the college. These pamphlets include particularly the publications of the United States Department of Agriculture and those of the State Experiment Stations of other Agricultural colleges in this country and abroad. Among the bound volumes, works on agriculture, horticulture, botany, entomology and the various sciences connected especially with agriculture predominate, but literature, history, economics, religion, sociology and art are also well represented. More than six hundred periodicals covering technical and general subjects, and including the best farm papers, are regularly taken and both the current numbers and the back files are readily accessible.

The Library is open for readers from 8 A.M. to 10 P.M. during term time and during part of Sunday. Vacation hours are somewhat shorter.

Short Course Students will find in the Library helpful material of many sorts in connection with their work, and are cordially invited to make use of this material. The librarian and library assistants are always on hand, ready and anxious to help.

THE INFIRMARY

The college maintains an infirmary for the care of sick or injured students. Students are urged to go to the infirmary when in need of the services rendered by the resident nurse or by a physician. Inasmuch as the physical director gives special attention to all student diseases, it is to be expected that students will go to the infirmary at his suggestion.

The infirmary fee is $2 a day, and will be charged when one or more meals are obtained at the infirmary, or when the student remains at the infirmary for one or more nights.

SCHOLARSHIP

The Jewish Agricultural Society, Inc., of New York instituted in 1908 a system of free scholarships to enable the children of Jewish farmers to attend the short winter courses offered by the agricultural colleges in the states in which they reside. The scholarships are awarded by competition, which consists in the writing of a brief essay on an agricultural topic. Children of Jewish farmers living and working on the farms of their parents are eligible to compete for these scholarships.

Applications for these scholarships should be made to The Jewish Agricultural Society, Inc., 301 East 14th Street, New York City.

POSITIONS

A student desiring a recommendation from the college must meet the following conditions:

1. He must be of good character.
2. His previous record must be good.
3. His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of farm experience cannot, as a rule be recommended for positions of responsibility. This is especially true for the better positions for which managers or superintendents are wanted.

DESCRIPTION OF COURSES

GENERAL AGRICULTURE

Soil Fertility

A study will be made of the classification, properties and management of soils. Soil fertility in its broad aspects will be studied. On completing the course the student will be expected to know: the names of the most common soils; methods of moisture control; best tillage practices; value of organic matter; the effects of lime; and the composition, properties and uses of manures and commercial fertilizers. Two class hours and one two-hour laboratory period a week.

Mr. C. H. Thayer

Field Crops

A course dealing primarily with the importance and production of field crops under Massachusetts conditions. Special consideration will be given to such factors as the use of rotations, culture methods, harvesting, and varieties. Practice in seed selection for purity and germination, and in judging such crops as corn and potatoes, will be included. Two class hours and one two-hour laboratory period a week.

Assistant Professor Cubbon

Types and Breeds of Live Stock

Outlines of the market classes and grades of beef cattle, horses, sheep, and swine, placing emphasis upon the characteristics of each class and its adaptations. The characteristics, the adaptations, and so far as is possible the historic development of each of the more important breeds of live stock are also carefully studied, as well as their distribution in America. Special emphasis is laid upon dairy cattle and horses in the judging work. Three class hours and two two-hour judging periods a week.

Live Stock Feeding

A study of the physiology of nutrition, the composition of feedstuffs, and of rational economic feeding. The feeding of dairy cattle and their management for profitable milk production receives first attention. Similarly, the feeding of horses, of beef cattle, of sheep, and of swine is studied. Three class hours a week.

Assistant Professor Glatfelter

Animal Breeding

A discussion of the more common problems pertaining to the breeding of live stock, their explanation and solution; in-breeding; cross-breeding; grading. The work of the most successful men in history is studied. Time is given to the study of pedigrees of the different breeds of dairy cattle and other stock. Three class hours a week.

Assistant Professor Rice

Farm Management and Accounts

A study of some of the problems of modern farming, such as choice of a farm, types of farming, size of farm and business, use of land, labor, equipment and materials, rotation of crops.

Most of the laboratory work will deal with a simple system of farm and cost accounting adaptable to either a small or a large farm. Additional work in farm accounts may be elected if desired. Two class hours and one two-hour laboratory period per week.

Professor Foord

Farm Motors

This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles, and tractors. Special attention is given to overhauling and repairing. Three class hours and two two-hour laboratory periods a week.

Professor Gunness and Mr. Pushee

Dairy Bacteriology

The characteristics and functions of bacteria and their relation to the different branches of the dairy industry. The scientific basis for cream ripening, sterilization. pasteurization, control of fermentation, and the production of the best quality of market milk. Two class hours and one two-hour laboratory period a week.

Mr. Packard

Animal Sanitary Science

The conservation of health is the keystone of successful animal husbandry. This course acquaints students with the essentials upon which the health of animals depends. In order that students may later guard the animals in their charge, attention is given to conditions favoring communicable and non-communicable diseases, and to prophylactic measures. Five class hours a week.

Doctor Lentz

Vegetable Gardening

The successful commercial production of vegetables requires a clear understanding of the problems that the vegetable grower meets. Practical contact is made with these in so far as the season of the year and time devoted to the work permit. Classroom instruction aims to make clear the fundamental principles underlying the problems, and gives opportunity for discussion. The laboratory periods aim to give the student practice in applying the basic principles to the problems he is to meet as a commercial vegetable grower. Some of these will be discussed under the leadership of market gardeners and specialists.

Students electing this course are required to take soil fertility and it is recommended that they take botany and entomology. Three class hours and two two-hour laboratory periods a week.

Mr. Stout

Horticultural Manufactures

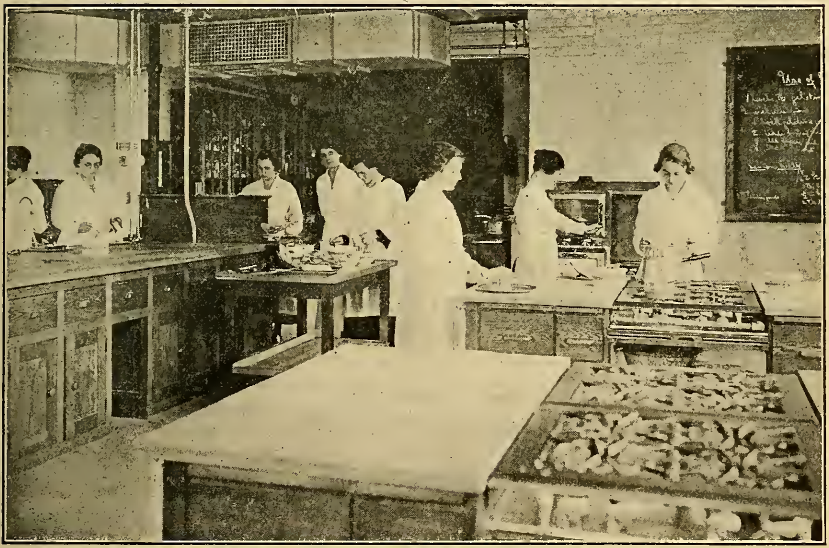
The utilization of culls and low-grade fruits and vegetables, and the marketing of excess crops are always serious problems to the producer. The economic conversion of these materials into palatable nutritious food products is becoming a greater necessity each year.

This course aims to place before the student the fundamental principles underlying the various means of food preservation and the manufacturing of food products.

The canning, drying, and storage of fruits and vegetables, together with the manufacture of many of their products, will be studied in detail, and the methods illustrated with laboratory exercises. Students will be given opportunity to do canning and drying, to manufacture many fruit and vegetable products, and to investigate storage conditions. The work in both classroom and laboratory will be of such a character as to be readily applied in the home or in the farm factory. Two class hours and two laboratory periods per week.

Prof. Chenoweth and Mr. Cartwright

Table Decorations by the Class in Floriculture



A Course in the Cooking School

The Supply and Marketing of Farm Products in Massachusetts

Marketing Farm Products. — This course is planned to give a critical description of the methods used by successful New England farmers and farmers' associations in selling farm products. Among the problems specifically studied are those of grading and storing farm products, and transporting them to market; the methods commonly used to finance the marketing process; the factors which influence prices; and the importance of efficient marketing in increasing farm income. Two class hours per week.

Assistant Professor Yount

Botany

A study of the structure, functions, and diseases of greenhouse, garden, orchard, and field crops, together with methods of disease prevention, including spraying and the application of fungicides. Two class hours a week.

Assistant Professor McLaughlin

Entomology

The course in entomology covers the topics outlined below. It is aimed to cover the fundamentals of insect life and insect control rather fully and to familiarize the student with the most important pests of New England. Time will permit the discussion of only the more important of these.

1. Insects and their nearest relatives — how to distinguish them.
2. Structure or make-up of insects and the practical application of this knowledge in insect control.
3. Development, metamorphoses (changes), and stages of insect life.
4. Control — including the composition, preparation, combination and use of insecticides, fumigants, etc.
5. Spraying apparatus and its use.
6. Beneficial and injurious insects.
    - A. The life history, habits, behavior and control.
    - B. Beneficial insects.

Three class hours a week. *Mr. Farrar*

Rural Sanitary Science and Hygiene

Significance of sanitary science in the relation to health: the theories of disease; air and ventilation; water and its protection; sewage disposal and purification; foods, their care and preservation; carriers of disease, susceptibility and immunity; infectious diseases; disinfection. Two class hours a week.

Mr. Packard

Agricultural Opportunities for Women

An outline of the occupational progress of women, with special attention to the vocational opportunities for women in agriculture and related fields. Two class hours a week.

Miss Hamlin

UNIT COURSES IN HOME ECONOMICS

Unit courses in Home Economics are offered for those interested in the newer aspects of Home Economics. Each course is planned to give in brief, fundamental principles of the topic in order to provide background for practical application in the study of specific problems. These courses will be of interest to the young woman at home, the club leader, the local extension leader, the social worker, and the homemaker.

Foods and Nutrition

In all budgets the largest expenditure must be for food. This course aims to assist in the selection and buying of such foods as will tend to maintain health. Emphasis will be given to the planning and preparation of meals to satisfy taste, health, and pocket-book. The adaptation of meals to children and school lunches will also be considered. Two class hours, and two three-hour laboratory periods a week.

Miss Knowlton

Textiles and Clothing

This course will include a study of buying, making and caring for clothing for the individual and the family. There will be practical work in making garments with emphasis on the selection of suitable materials of good value and on short cuts, and easy methods of construction. The selection and cost of a suitable attractive wardrobe will be studied through comparison of ready made and home made clothing. The course will include a brief study of textile fibers, manufacture and tests.

Approximate cost of materials used $5.00-$10.00. Two class hours and two three-hour laboratory periods a week.

Miss Tucker

Health Education

The aim of this course is to teach fundamental principles of maintaining health. This will include ways of living to prevent sickness, the care of the individual in case of unavoidable sickness, and the right attitudes towards health. Three class hours a week.

Miss Skinner

Home Management

Every woman wishes a home which runs smoothly, whether it be a single room, an apartment, or a large house. This course aims to assist in such ways as these: selection and care of equipment, study of best ways of working, use of time and labor-saving devices, and securing the largest measure of satisfaction in spending the income. Five class hours a week.

Miss Skinner

VOCATIONAL AGRICULTURAL TEACHING

The Massachusetts Agricultural College has been designated by the State Department of Education as the institution for training teachers of vocational agriculture for the State. The work is being carried along the following lines:

1. Regular college courses, four or five years, leading to a degree.
2. Shorter courses to supplement the training of more mature men who are partly qualified through practical experience, or through scientific study of agriculture, or through study of methods and principles of education, or through teaching experience.
3. Professional improvement training for employed teachers in regular college courses, courses in the winter term, or courses specially organized on request of a sufficient number of students.

The Winter Short Course period provides in part for the second and third lines. An intensive course during the first two weeks is provided for the instructors who may leave their teaching for only a brief period. This course may be continued on a higher schedule for such persons as may be able to remain throughout the winter term.

For all of these there will be an opportunity to take courses in general agricultural teaching, special Massachusetts problems, and agricultural subject-matter. An attempt will be made to furnish any subject-matter course which enough men may request.

High school principals and science teachers who have had farm experience, or practical agriculturists, may find this an opportunity to qualify for vocational teaching.—a field in which the demand is fairly strong.

The educational courses supplemented by an adequate amount of agriculture will be credited by the Department of Education towards approval of candidates or for professional improvement programs. Similar courses are offered in the summer school.

The following courses have proved to be of greatest benefit to those enrolled at this time:

Principles and Methods of Teaching

The course is of most benefit to those who expect to teach or who are teaching. It covers some of the general principles and methods of teaching and their application to particular cases. This latter means a study of cases in school work, taken from actual experience, analyzed and illustrated by the class. Outside reading beyond the text in hand is required. By arrangement with the instructor, Winter School students may come into the regular class. Five class hours per week.

Professor Welles

Special Methods in Vocational Agricultural Teaching

This course consists of intensive work on the important principles underlying the successful teaching of vocational agriculture and a thorough study of the special plans and activities of the teacher of this subject. The job is analyzed to determine what the teacher must know as to character, setting, technique, and relations of his work. All available sources are consulted for information as to State requirements, industrial conformity, and professional ideals. Illustrative material showing how particular departments and schools work out their problems in this subject is gathered and studied. Plans for the year's work, unit study and daily lessons are worked out on the home-project basis. Special lessons are planned and taught by students in moot class.

In case both experienced and untrained men apply for this course, the group may be divided into two sections. Five class hours per week.

Professor Welles and Mr. Heald

Agricultural Teaching Improvement Problems in Massachusetts

A seminar course for employed teachers or directors of vocational agriculture, dealing with problems which constantly arise in the agricultural schools of the State. Prospective teachers may be admitted by special arrangement. Includes plans for the coming season, and campaigns for improved methods based on experiences and needs of men in service; for this season special emphasis on summer teaching of related subjects, and the proper approach to teaching a vocational topic.

Class meets for double periods five days each week for two weeks. The class will continue for a longer term at four days each week if there is a sufficient demand.

Mr. Heald

TEN WEEKS' WINTER COURSE IN FRUIT GROWING

MASSACHUSETTS AGRICULTURAL COLLEGE
AMHERST, MASS.

January 2 to March 15, 1929

A specialized course in fruit growing intended for persons who are interested in the growing of fruit for profit.

The work will require practically all of the student's available time while at the college and every student is expected to take all the courses offered.

Enrollment is limited to fifteen students.

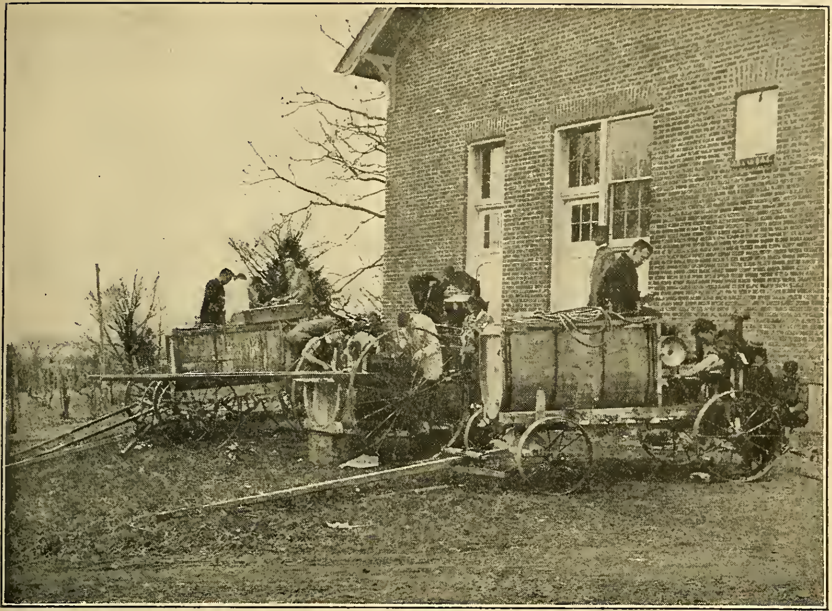
Table of Required Courses

	Course	Class Hours	Laboratory Periods	Total Credits
I.	Tree Fruits	4	1	5
II.	Pruning	2	2	4
III.	Spraying	3	1	4
IV.	Small Fruits	3	–	3
V.	Harvesting and Marketing	2	2	4
VI.	Farm Motors	3	2	5

Description of Courses

I. *Tree Fruits.*

A study of fundamental problems connected with the production of apples, pears, peaches, plums, and cherries. The course includes a consideration of such questions as the selection of varieties, propagation, purchasing and handling



Studying Orchard Spray Rigs

nursery stock, planning and setting an orchard, the care of young trees, and the management of bearing orchards.

Students are given practice in the identification of common varieties, in selecting fruit for show purposes, in judging, and in the most useful methods of budding and grafting. Four class hours and one two-hour laboratory period a week.

Mr. French

II. *Pruning Tree Fruits.*

A consideration of modern methods of pruning apples, pears, peaches, and other tree fruits. In addition to class room discussions, students are required to prune trees in the orchards until familiar with the pruning of each fruit. Related subjects are studied also, such as the relation of pruning to fruit bearing, the best types of pruning tools, dressings for pruning wounds, and the care of top-worked trees. Two class hours and two two-hour laboratory periods a week.

Mr. Roberts

III. *Spraying.*

A thorough study of modern methods of pest control in orchards. Spray pumps, nozzles, spray guns, and other spray machinery are examined and operated, and spray materials are made and studied. The damage done by common orchard insects and diseases is considered, and their life histories are studied in relation to control methods. Attention is given also to the development of spray schedules for common fruits. A good assortment of modern sprayers ranging from types of hand machines to heavy power outfits is available for study and trial. Three class hours and one two-hour laboratory period per week.

Mr. Roberts

IV. *Small Fruits.*

This course deals with all the principal small fruits grown in Massachusetts, such as strawberries, raspberries, blackberries, currants, and grapes. It attempts to answer such questions as: What varieties are best adapted to our Massachusetts conditions? How shall we prune our grapes, raspberries and blackberries? What method of training will give the best results? How can we control the pests which attack these fruits? What type of culture and fertilizing is best for each of them? When and how should we harvest them, and how should we pack and market them in order to secure the highest prices? Three class hours per week.

Professor Sears

V. *Harvesting and Marketing.*

This course is concerned with the handling of fruits from the tree to the consumer. The picking, grading, packing, storing, and marketing of fruits are considered in detail, and practice in grading and packing apples is continued until a fair degree of skill is acquired.

Grading laws are studied and discussed, also such subjects as types of storage, storage troubles and how to avoid them, sizing machines, packages and their uses, and markets and market requirements. Two class hours and two two-hour laboratory periods per week.

Professor Van Meter

VI. *Farm Motors.*

This course includes study and practice work with the types of gasoline engines commonly used on fruit farms. Lectures and textbook assignments deal with the theory and construction of stationary engines, automobiles and tractors, and their practical operation is studied in the laboratory. Special attention is given to overhauling and repairing. Three class hours and two two-hour laboratory periods per week.

Professor Gunness and Mr. Pushee

TEN WEEKS' COURSE FOR GREENSKEEPERS

A specialized course for men engaged in the profession of greenskeeping, or members of greens committees. This course has been arranged in co-operation with the New England Greenskeepers' Club, and the subjects as outlined can be effectively studied during the winter months.

General Requirements

Applicants for this school must be members of the greens committee, greenskeepers, or must have had at least one season's experience on a golf course, and their application blanks must be countersigned by the greenskeeper and chairman of the greens committee.

No entrance examinations are required, but it is expected that the student will have a reasonable education in the English language.

The number of students is limited to fifteen.

The college reserves the right to reject any applicant obviously unqualified for the work, or to dismiss any student for misconduct, or failure to properly meet the requirements of the course.

The winter school certificate will be given to those who complete the full course with credit.

Courses Offered

			Credits
I.	Motors	Jan. 2—Mar. 15	5
II.	Water Systems	Jan. 2—Feb. 9	2½
III.	Soils and Fertilizers	Feb. 11—Mar. 15	2½
IV.	Equipment	Jan. 2—Feb. 9	2½
V.	Managerial Problems	Feb. 11—Mar. 15	2½
VI.	Grasses and Grass Seed	Jan. 2—Feb. 16	3
VII.	Drainage	Feb. 18—Mar. 15	2
VIII.	Fundamentals of Landscape Arrangement	Jan. 2—Feb. 2	2
IX.	Cost Keeping and Analysis	Feb. 4—Mar. 15	3
			25

Description of Courses

I. *Motors.* — This course deals with the gasoline engine as used for stationary work, automobiles and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles and tractors. Special attention is given to overhauling and repairing.

Professor Gunness and Mr. Pushee

II. *Water Systems.* — A study of standard types of water systems, with particular reference to the relation of size of pipe, pressure and nozzles, to the flow and delivery of water.

Professor Gunness

III. *Soils and Fertilizers* (special for greenskeepers). — Fundamental properties of soils and their management as related to golf green conditions will constitute the main part of the course. The study of fertilizers and their uses will be made as complete as possible. Individual problems and discussions will be given all the time and attention warranted. Twenty-five hours of class work, to be divided between class room and laboratory as is convenient.

Assistant Professor M. H. Cubbon

IV. *Equipment.* — A study of the major equipment used on the golf course, with particular reference to mowers (fairway and putting green), spraying equipment and compost mixers. A very thorough study of lawn mowers will be made in this course. All types of mowers are available for study. Minor equipment will also be discussed.

Assistant Professor L. S. Dickinson

V. *Managerial Problems.* — This course uses for its laboratory a very large and complete model of a golf course, about which the many problems of a greenskeeper are discussed. The model is so complete that the discussion is practical and not of a theoretical nature.

For example: The economy of properly routing a fairway mower will be demonstrated.

Assistant Professor L. S. Dickinson

VI. *Grasses and Grass Seed.* — This course will enable the student to identify the various grasses, also grasses and weed seeds usually found in seed mixtures. The relative germination of grass seeds will be demonstrated and applied to their uses for golf and tennis court purposes. The soil and fertilizer requirements of the various grasses will be discussed.

Assistant Professor L. S. Dickinson

VII. *Drainage.* — The entire problem of land drainage will be discussed and practical problems worked out. The student will be taught the use of the level and how to set ditch grades.

Assistant Professor Markuson

VIII. *Fundamentals of Landscape Arrangement of Trees, Shrubs and Walks.* — Principles of Landscape Arrangement, particularly adapted to golf club houses. Desirable varieties of shrubs and trees and their adaptability to various soils and weather conditions.

Mr. Towne

IX. *Cost Keeping and Analysis.* — The value of cost keeping and its analysis will be demonstrated, and a method of cost keeping will be taught. The many factors that enter into the cost will be noted, analyzed and adopted to individual problems. The distribution and directing of the workmen will also be studied.

Assistant Professor L. S. Dickinson

WINTER SHORT COURSES IN DAIRYING

January 14—February 8, 1929

STAFF OF INSTRUCTION

J. H. Frandsen, M.S., *Professor of Dairying.*
M. J. Mack, M.S., *Assistant Professor of Dairying.*
H. G. Lindquist, M.S., *Instructor in Dairying.*

In addition to the above, specialists in the commercial field will be secured to help with the laboratory work and discussion.

CALENDAR, JANUARY 14, 1929 TO FEBRUARY 8, 1929

Course I. Testing and Milk Plant Operation, and Manufacture of Surplus Milk Products, Monday, January 14, 8 A.M., to Friday, January 25, 12 M.

Course II. Ice Cream Making, Monday, January 28, 8 A.M., to Friday, February 8, 12 M.

GENERAL INFORMATION

To meet the ever-increasing demand for trained men in the dairy industry, the Massachusetts Agricultural College is offering two ten-day courses in dairying. These courses will be offered between January 14 and February 8, 1929. The courses cover especially the testing, analysis and inspection of milk and dairy products. Emphasis is placed on the underlying principles of milk plant operation, butter, soft cheese, culture buttermilk, and ice cream making.

Many a milk plant or creamery operator, superintendent, or foreman would be more efficient and would get more satisfaction out of his work if he fully understood the fundamental reasons concerned with the successful operation of his dairy plant.

The man who will profit most and the one that should be encouraged by the plant operator, should be interested in his work, should want to know more about his work and should be anxious to advance and become an expert in his particular branch of the dairy industry. Owners of dairy plants sending men of this type will profit principally through the fact that the men will learn economy of operation resulting in a saving of labor, with more efficient handling and processing methods resulting in better quality and more uniform products. The courses are purposely given at a time of year when help can most easily be spared.

The courses are intended not only for experienced milk plant, ice cream and creamery men, but for men who have little dairy experience, but with a desire for knowledge in the various dairy manufacturing fields. Those who are inexperienced should plan to take both courses. Farm men and women, who are responsible for milk handling, butter making, or the making of soft cheese will also find the first course adapted to their needs.

The courses are so planned that a student can report for the first course on January 14 and then take the following course, finishing February 8, or he can take either course separately. There are no prerequisites for either course. A certificate showing the subject studied is given at the end of each course to those doing satisfactory work.

Admission. — There are no entrance requirements except that the student must be eighteen years of age and must have a common school education.

Registration. — Students should enroll by mail. See application blank in back of catalogue.

Enrollment for Course I, "Testing, Milk Plant Operation and Manufacture of Surplus Milk Products," must be made by January 10, 1929. Those failing to enroll by mail may enroll on January 12. Students should arrive January 13 as classes begin at 8 A.M. January 14.

Enrollment for Course II, "Ice Cream Making," must be made on or before January 26 and should be made by mail by January 18, as it will be necessary to limit the size of the class if it gets too large. Those enrolling first will be given preference. *Note:* A second course will be given if the number of students warrant it.

All applications for entrance to these courses should be addressed to the Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

Upon arrival the students should report at the office of the Director of Short Courses in South College, for information concerning rooming accommodation.

Tuition, Fees and Expenses. — There is a tuition fee of two dollars for each course, and each student is required to pay the Treasurer a registration fee of two dollars per course. These fees should be mailed with the application.

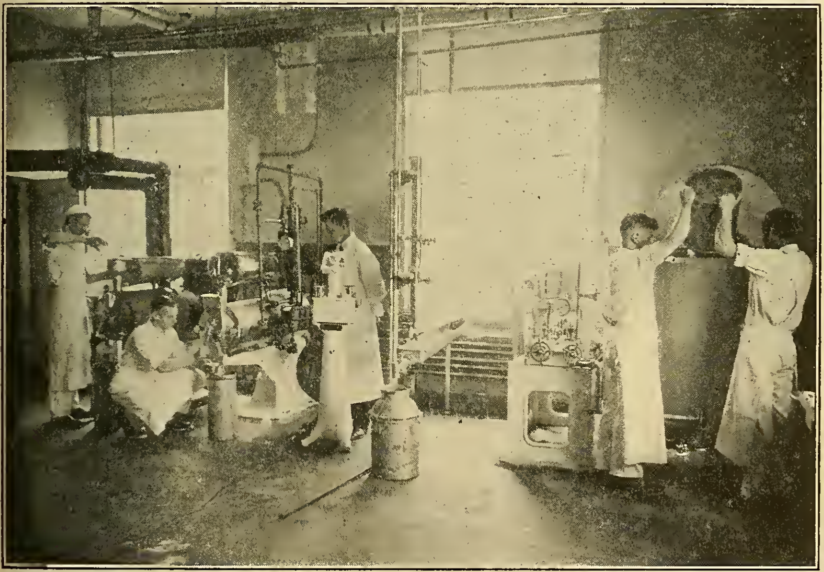
Students will need white suits for laboratory work, and may wish to purchase one or more text-books for each course.

Board may be obtained at the college dining hall for approximately $7.50 a week. Rent for furnished rooms in private houses varies from $2.50 to $5.00 a week for each occupant.

Positions. — The dairy department is often called upon to recommend candidates for positions, and stands ready to recommend those who take these courses with the idea of getting positions, providing they are of good character, have good previous records, and do satisfactory work in the courses.

Methods of Instruction. — Instruction is given (1) by lecture, by recitation and discussion, and by the working out of problems; (2) by practical work in the laboratories. In general, two one-hour periods each day will be allowed for discussion and two three-hour periods for laboratory work. The student is expected to give practically the entire day from 8 A.M. to 5 P.M. to his work. The services of the entire department are available at different times for men taking these courses.

Flint Laboratory. — The dairy building is practically new, and with its equipment stands as one of the best college dairy buildings in the country. The testing laboratory is spacious and is well equipped for testing milk and its products. Equipment includes a Mojonnier Tester and Bacteriological Equipment. A regular supply of milk and cream is received daily, and the market milk department is equipped to weigh, clarify, pasteurize, and handle in a modern way the milk and cream and all products made therefrom.



Ice Cream Making

There is a ten-ton compression refrigerating system in the building arranged for making ice. freezing ice cream and cooling the ice cream hardening box. The ice cream room contains a brine freezer, a direct expansion freezer, a mixing tank, a homogenizer, a filling machine and other smaller equipment.

The butter department is equipped with power and hand churns, starter making equipment, pasteurizer and various makes of separators. The cheese room is equipped to make cheese of all kinds and especially soft cheese.

Description of Winter Courses

Course I. Testing, Milk Plant Operation and Manufacture of Surplus Milk Products (January 14-25).

This course is designed to help men and women to become more proficient in operating the Babcock Test, acidity tests, use of the lactometer, the Methylene Blue test and Plate Counts and other tests commonly used in testing, analyzing and inspecting dairy products. It is designed to help milk plant and creamery employees to a better understanding in the economy of operation and uniformity of product and will help to prepare men to be foremen and superintendents in milk plants.

Some of the lecture and discussion topics are: general scope of the market milk industry, value of milk as a food, relation of bacteria to milk, sanitary production, marketing, plant construction and selection of equipment, processing delivery, handling surplus, standardizing, grading, and labeling, and care of milk in the home. Special attention will be given to economic methods of marketing surplus milk through cottage and other soft cheeses, and commercial buttermilk.

Laboratory exercises will cover milk sampling, the scoring of dairies, cream line problems, the scoring of milk, the study of milk plant equipment, milk processing, the manufacture of commercial buttermilk, of cottage, neufchatel, and cream cheese and butter.

Practical application of dairy tests and of lecture work will be carried out in the college creamery and dairy barn.

Course II. Ice Cream Making (January 28 to February 8).

This course aims to present the most up-to-date information on ice cream making and fit men to operate or take charge of operating any part of the ice cream business.

Lectures and discussions will cover the selection of ingredients for the mix, standardizing and calculating the mix, processing the mix, factors influencing the yield, causes and remedies of ice cream defects, the manufacture of brick ice cream, special ice creams and fancy molds, marketing ice cream, and the handling of ammonia refrigerating plants.

Laboratory exercises will include work on the whipping properties of different creams, tests of ingredients used in the mix, study of ice cream equipment and its operation, calculating and making up of the ice cream mix, effect on the quality of ice cream of such factors as fat content, solids not included in the fat content, temperature of the mix, temperature of brine, age of the mix, speed of the dasher, treatment of the cream or mix, and making various kinds of frozen delicacies.

TEN WEEKS' WINTER SCHOOL COURSE IN POULTRY RAISING

MASSACHUSETTS AGRICULTURAL COLLEGE
AMHERST, MASS.

January 2 to March 15, 1929

STAFF OF INSTRUCTION

John C. Graham, B.S.Agr., *Professor of Poultry Husbandry.*
William C. Sanctuary, B.S., *Professor of Poultry Husbandry.*
Luther Banta, B.S., *Assistant Professor of Poultry Husbandry.*
Marion G. Pulley, B.S., *Instructor in Poultry Husbandry.*
John H. Vondell, *Superintendent of Poultry Plant.*

GENERAL INFORMATION

Aim. — The purpose of this course is to give the students a good survey of the entire field of poultry production and cover the work as intensively as time will permit. It is designed for those who wish to follow poultry keeping as a vocation and can spend only one term for preparation.

Facilities. — Our large poultry plant of 2,000 birds equipped with modern incubators and brooders of various kinds, together with other adequate equipment and laboratories, will be at the service of students in carrying on their laboratory work.

The M. A. C. Poultry Club, a student organization, meets twice a month for special discussions on current topics and lectures by prominent poultrymen or specialists.

Description of Courses

Course I. Incubation, Brooding and Marketing. — This course considers practices in incubating and brooding chicks and the fundamental principles involved in these practices. It gives the student an opportunity to operate different types of incubators and brooders, to carry through a hatch to completion, to brood chicks and to ship day-old chicks.

The course also acquaints the students with the demands of eastern markets. It teaches them the practices which fit poultry products to meet these demands. Students become acquainted with grading systems for eggs and methods of candling, grading and packing involved. Best methods of preparing poultry for market are considered and the students are given practice in selecting, killing and dressing for eastern markets. 3 lectures and 2 2-hour laboratory periods a week. Credits—5.

Miss Marion G. Pulley

Course II. Feeding and Culling. — This course embraces a study of the fundamental principles of nutrition, and their application to the problems of feeding the poultry flock—the most expensive item in operating a poultry enterprise. Feeding both the young and adult stock is included.

The work on culling includes a study of the factors effected by egg production, and those that limit egg production in the individual. Trapnested birds with known records are freely employed in the laboratory periods to constantly check the judgment of the student in estimating production. This study has direct applicability in the constant elimination of non-producers from the flock, and the selection of outstanding breeders. 3 lectures and 2 2-hour laboratory periods a week. Credits—5.

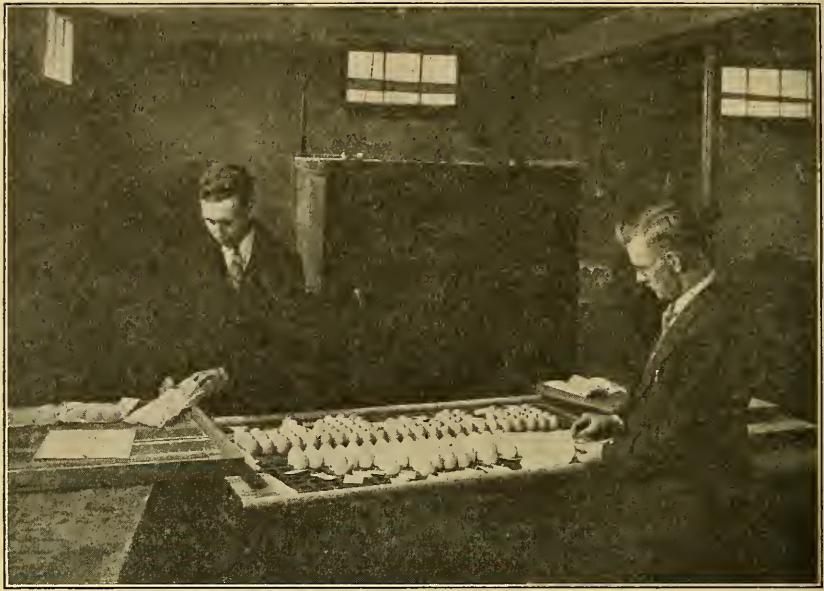
Assistant Professor Luther Banta

Course III. Poultry Breeding and Sanitation. — The first part of this course will consider practical methods of improving poultry by selective breeding. Students will participate in the selection of the breeders at the College Plant, and will follow the eggs from these breeders through the various steps in pedigreed hatching, and the offspring through the various records of a simplified system of pedigreed record keeping. Those principles of heredity most enlightening to the selection steps will be carefully studied.

The second part of the course will cover a disease-prevention program. Sufficient work in anatomy and in physiology will be studied to enable the students to distinguish between healthy and gross pathological conditions. The use of disinfectants and insecticides for maintaining clean quarters and birds will be considered. The increasing use of vaccines and blood testing will be stressed. The nature and course of the most common diseases will be related to the pathological symptoms and to clean-up and control methods. All will be summarized in the consideration of a general quarantine program as the most practical method of preventing disease. 3 lectures and 2 2-hour laboratory periods a week. Credits—5.

Professor W. C. Sanctuary

Course IV. Poultry Housing Management and Farm Organization. — This course covers the principles and practices of housing, based upon the biological needs of the domestic fowl. Such points as location, economic construction, ventilation, size of unit, and general flock management will receive special attention.



Students Starting a Pedigree Hatch

A study will be made of the modern trend of poultry farm organization from the commercial point of view. Each student will prepare a definite and detailed plan for the farm he hopes to develop later. Much of the work will center about this plan which will emphasize and correlate the work in breeding, incubation, brooding, growing, market egg production, and marketing. 5 lecture periods a week. Credits—5.

Professor J. C. Graham

THE STOCKBRIDGE SCHOOL OF AGRICULTURE

A Two-Year Course in Practical Agriculture

The Stockbridge School of Agriculture is intended for men and women who desire a working knowledge of the best methods in farming but who cannot spend four years in college. An applicant for admission must be at least 17 years of age and must have a common school education. There are no examinations.

There is a tuition fee of $20.00 per term, or $60.00 per year, for residents of Massachusetts; others are charged $60.00 per term, or $180.00 per year. All students must pay small laboratory fees in several courses.

The course is so organized that each student specializes along one of the following lines: animal husbandry, poultry, dairy manufactures, general horticulture, fruit growing, floriculture, or vegetable gardening. Each specialized course is intensive, with emphasis on practical work under competent supervision. It covers two winters and the intervening summer. The first year is made up of six months of study at the college followed by six months of practical farm experience on selected farms. Nine months more of study at the college completes the course. A diploma is given.

THE SIX WEEKS' SUMMER SCHOOL

The Summer School at the Massachusetts Agricultural College has been a feature of the short course work for the past twenty-one years.

The summer school program is arranged for:

1. School superintendents and teachers connected with high schools, normal schools, colleges and universities who seek advanced instruction either with or without relation to an academic degree.
2. College students who desire to further their regular college work.
3. Teachers who desire to pursue courses that will better prepare them for their work.
4. Any serious student who finds courses suited to his preparation and needs.

For 1929 the Summer Session will begin July 1 and close August 10. The following courses were offered during the past summer:

Graduate and Undergraduate Courses

Courses in Education and Allied Subjects

Principles and Methods of Teaching
History of the Philosophy and Practice in Education
Educational Psychology
Secondary Education
Special Methods in Teaching Vocational Agriculture
Tests and Measurements
Experimental Psychology
The Employed Teacher of Agriculture
Vocational Education
English Literature
Dramatic Presentation

Courses in Home Economics

Clothing
Foods
Home Furnishing
Methods of Teaching Home Economics

Science and Allied Courses

Insect Life
Advanced Entomology
Public Health
Botany for the Teacher
Fresh Water Algae, Fungi, Liverworts, Mosses and Ferns
Physiological and Food Chemistry
Geologic Processes and the Origin of Land Forms
Animals and Plants of the Past
College Algebra

Horticulture and Landscape Gardening

Garden Design
Surveying and Mapping
Plant Materials
Garden Flowers and Bedding Plants

Tuition fee $10.00 for six weeks' term. All other expenses very moderate.

For catalog, write Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

PUBLIC DOCUMENT No. 31

THE M. A. C. BULLETIN
AMHERST, MASSACHUSETTS

VOLUME XXI JANUARY, 1929 NUMBER 1

PUBLISHED EIGHT TIMES A YEAR BY THE MASSACHUSETTS AGRICULTURAL COLLEGE: JAN., FEB., MAR., MAY, JUNE, SEPT., OCT., NOV. ENTERED AT THE POST OFFICE, AMHERST, MASS., AS SECOND CLASS MATTER.

THE SIXTY-SIXTH ANNUAL REPORT OF THE MASSACHUSETTS AGRICULTURAL COLLEGE

PART II.—CATALOGUE OF THE COLLEGE FOR 1928—1929

Publication of this document approved by the Commission on Administration and Finance

6M-9-'28. No. 3308

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LEGISLATION PERTAINING TO THE COLLEGE.

Without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life. — *Act of Congress, July 2, 1862.*

THE COLLEGE CHARTER. — "The leading object of the college shall be to teach subjects relating to agriculture and the mechanic arts, so as to promote liberal and practical education. Its curriculum may include other scientific and classical studies and shall include military tactics." — *From Chapter 75 of the General Laws of Massachusetts.*

This issue of the catalogue represents the status of the college for the current college year, with provisional announcement of courses of study and other matters for the year to follow. When deemed necessary, additional announcements are made in a supplementary bulletin, published in the spring.

The college reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

CALENDAR.

1928-1929.

September 12–15, Wednesday–Saturday	Entrance Examinations
September 17, Monday	Fall term begins for Freshmen
September 19, Wednesday	Fall term begins for all except Freshmen
October 12, Friday	Holiday, Columbus Day
November 12, Monday	Holiday, Armistice Day
November 28–December 3, Wednesday, 12 M.–Monday, 7.30 A.M.	Thanksgiving Recess
December 22, Saturday, 12 M.	Fall term ends

1929.

January 2, Wednesday, 8.00 A.M.	Winter term begins
February 22, Friday	Holiday, Washington's Birthday
March 23, Saturday, 12 M.	Winter term ends
April 1, Monday, 7.30 A.M.	Spring term begins
April 19, Friday	Patriots' Day
May 30, Thursday	Holiday, Observance of Memorial Day
June 14–17, Friday–Monday	Commencement
June 20–22, Thursday–Saturday	Entrance Examinations
September 11–14, Wednesday–Saturday	Entrance Examinations
September 16, Monday	Fall term begins for Freshmen
September 18, Wednesday	Fall term begins for all except Freshmen
October 12, Saturday	Holiday, Columbus Day
November 11, Monday	Holiday, Armistice Day
November 27–December 2, Wednesday, 12 M.–Monday, 7.30 A.M.	Thanksgiving Recess
December 21, Saturday, 12 M.	Fall term ends

1930.

January 2, Thursday, 8.00 A.M.	Winter term begins

THE TRUSTEES.

Organization of 1928.

Members of the Board.

	TERM EXPIRES
Nathanial I. Bowditch of Framingham	1929
William Wheeler of Concord	1929
Sarah Louise Arnold of Lincoln	1930
James F. Bacon of Boston	1930
Frank Gerrett of Greenfield	1931
Harold L. Frost of Arlington	1931
Charles H. Preston of Danvers	1932
Carlton D. Richardson of West Brookfield	1932
Davis R. Dewey of Cambridge	1933
John F. Gannon of Pittsfield	1933
George H. Ellis of West Newton	1934
Philip F. Whitmore of Sunderland	1934
John Chandler of Sterling Junction	1935
Frederick D. Griggs of Springfield	1935

Members Ex Officio.

His Excellency Governor Alvan T. Fuller of Boston, *President of the Board of Trustees.*
Roscoe W. Thatcher, *President of the College.*
Payson Smith, *State Commissioner of Education.*
Arthur W. Gilbert, *State Commissioner of Agriculture.*

Officers of the Trustees.

His Excellency Governor Alvan T. Fuller of Boston, *President.*
William Wheeler of Concord, *Vice-President.*
Robert D. Hawley of Ahmerst, *Secretary.*
Fred C. Kenney of Amherst, *Treasurer.*
Frank Gerrett of Greenfield, *Auditor.*

Standing Committees of the Trustees.[1]

Committee on Finance.

Chairman.
George H. Ellis.
Nathaniel I. Bowditch.
Frank Gerrett.
William Wheeler.
Carlton D. Richardson.

Committee on Faculty and Program of Study.

William Wheeler, *Chairman.*
James F. Bacon.
Payson Smith.
Davis R. Dewey.
John F. Gannon.
Arthur W. Gilbert.
Miss Sarah Louise Arnold.

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[1] The President of the College is ex-officio member of each committee.

Committee on College Farm.

Nathaniel I. Bowditch, *Chairman.*
Frank Gerrett.
George H. Ellis.
Arthur W. Gilbert.
Carlton D. Richardson.

Committee on Horticulture.

Harold L. Frost, *Chairman.*
John Chandler.
Charles H. Preston.

Committee on Experiment Station.

Charles H. Preston, *Chairman.*
Arthur W. Gilbert.
John Chandler.
Harold L. Frost.
Carlton D. Richardson.
Miss Sarah Louise Arnold.

Committee on Buildings and Grounds.

George H. Ellis, *Chairman.*
Frank Gerrett.
James F. Bacon.
Charles H. Preston.
William Wheeler.

Committee on Extension Service.

John Chandler, *Chairman.*
Nathaniel I. Bowditch.
George H. Ellis.
Harold L. Frost.
Davis R. Dewey.
John F. Gannon.
Arthur W. Gilbert.
Miss Sarah Louise Arnold.

OFFICERS OF THE INSTITUTION.

As of November 1, 1928.

Officers of Administration.

Roscoe W. Thatcher, D.Agr., LL.D. . . . . . . President's House.
President.
William L. Machmer, A.M. . . . . 25 Amity Street.
Dean.
Fred C. Kenney . . . . Mount Pleasant.
Treasurer.
Henry T. Fernald, Ph.D. . . . . 44 Amity Street.
Director of the Graduate School.
Fred J. Sievers, M.S. . . . . South Pleasant Street.
Director of the Experiment Station.
Roland H. Verbeck, B.S. . . . . 14 Orchard Street.
Director of Short Courses.
Willard A. Munson, B.S. . . . . 101 Butterfield Terrace.
Director of Extension Service.
Robert D. Hawley, B.S. . . . . South Amherst.
Secretary.
Basil B. Wood, A.B. . . . . 11 South Prospect Street.
Librarian.
William I. Goodwin, B.S. . . . . North Amherst.
Field Agent.

The Resident Teaching Staff.

(The names of the faculty are arranged in groups according to rank and in sequence according to seniority of service in the institution.)

Professors Emeritus.

William P. Brooks, Ph.D. . . . . 6 Farview Way.
Emeritus Professor of Agriculture.
William R. Hart, LL.B., M.A. . . . . . . 1820 San Pascual Street, Santa Barbara, Calif.
Emeritus Professor of Agricultural Education.

Professors.

Roscoe W. Thatcher, D.Agr., LL.D. . . . . President's House.
President.
Joseph B. Lindsey, Ph.D. . . . . 47 Lincoln Avenue.
Goessmann Professor of Agricultural Chemistry and Head of Department of Plant and Animal Chemistry.
John E. Ostrander, A.M., C.E. . . . . . 33 North Prospect Street.
Professor of Mathematics and Head of Department.
Henry T. Fernald, Ph.D. . . . . 44 Amity Street.
Professor of Entomology and Head of Department.
Frank A. Waugh, M.S. . . . . Campus.
Professor of Landscape Gardening, Head of Department, Head of Division of Horticulture.
A. Vincent Osmun, M.S. . . . . 16 Northampton Road.
Professor of Botany and Head of Department.
Clarence E. Gordon, Ph.D. . . . . 38 Lincoln Avenue.
Professor of Zoölogy and Geology, Head of Department, Head of Division of Science.
Fred C. Sears, M.S. . . . . Mount Pleasant.
Professor of Pomology and Head of Department.

James A. Foord, M.S.Agr. . . . . 54 Lincoln Avenue.
Professor of Farm Management and Head of Department.

A. Anderson Mackimmie, A.M. . . . . North Amherst.
Professor of History, Economics and Sociology, Head of Department, Head of Division of Social Sciences.

Alexander E. Cance, Ph.D. . . . . 9 Fearing Street.
Professor of Agricultural Economics and Head of Department.

Joseph S. Chamberlain, Ph.D. . . . . Mount Pleasant.
Professor of Organic and Agricultural Chemistry and Head of Department.

John C. Graham, B.S.Agr. . . . . 68 Lincoln Avenue.
Professor of Poultry Husbandry and Head of Department.

G. Chester Crampton, Ph.D. . . . . Fernald Hall.
Professor of Insect Morphology.

Charles A. Peters, Ph.D. . . . . Sunset Place.
Professor of Inorganic and Soil Chemistry.

George E. Gage, Ph.D. . . . . The Davenport.
Professor of Bacteriology and Physiology and Head of Department.

William L. Machmer, A.M. . . . . 25 Amity Street.
Dean of the College and Professor of Mathematics.

Arthur N. Julian, A.B. . . . . 4 Farview Way.
Professor of German.

Curry S. Hicks, B.Pd., M.Ed. . . . . Sunset Avenue.
Professor of Physical Education and Hygiene and Head of Department.

Walter W. Chenoweth, M.S. . . . . North Amherst.
Professor of Horticultural Manufactures and Head of Department.

Harold M. Gore, B.S. . . . . Plainville Road.
Professor of Physical Education.

Christian I. Gunness, B.S. . . . . 105 Butterfield Terrace.
Professor of Agricultural Engineering and Head of Department.

Charles H. Thompson, M.S. . . . . Mount Pleasant.
Professor of Horticulture.

Charles H. Patterson, A.M. . . . . 26 Lincoln Avenue.
Professor of English and Head of Department of Languages and Literatures.

John B. Lentz, A.B., V.M.D. . . . . 3 Dana Street.
Professor of Veterinary Science and Head of Department.

Arthur B. Beaumont, Ph.D. . . . . 51 Amity Street.
Professor of Agronomy and Head of Department.

Ralph A. Van Meter, B.S. . . . . North Amherst.
Professor of Pomology.

Edna L. Skinner, M.A. . . . . Fearing Street.
Professor of Home Economics, Head of Division.

Winthrop S. Welles, B.S. . . . . 23 Lincoln Avenue.
Professor of Agricultural Education and Head of Department.

Clark L. Thayer, B.S. . . . . 2 Mount Pleasant.
Professor of Floriculture and Head of Department.

Laurence R. Grose, A.B., M.F. . . . . 32 Amity Street.
Professor of Forestry and Head of Department.

William C. Sanctuary, B.S. . . . . 11 Cottage Street.
Professor of Poultry Husbandry.

Harry N. Glick, Ph.D. . . . . 27 Fearing Street.
Professor of Agricultural Education.

Wallace F. Powers, Ph.D. . . . . 7 Allen Street.
Professor of Physics and Head of Department.

N. Butler Briscoe, Major, Cavalry, U. S. A. . . . . 2 Allen Street.
Professor of Military Science and Tactics and Head of Department.

Julius H. Frandsen, M.S.A. . . . . 35 Lincoln Avenue.
Professor of Animal and Dairy Husbandry and Head of Department.

Fred J. Sievers, M.S. . . . . South Pleasant Street.
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GENERAL INFORMATION.

HISTORICAL SKETCH.

One of the outstanding achievements of the middle of the nineteenth century was the remarkable development in the field of science. This, in turn, brought about great changes in industry, transportation and agriculture and stimulated the desire for new information and further training. People were enthusiastic about the possibilities of the future. It is not surprising, therefore, that scientific courses gradually found their way into the academies and colleges. This was not without opposition from the friends of the old classical training, however. In many instances institutions founded along literary and philosophical lines did not favor the introduction of courses based on the needs of students desiring to perfect themselves in the technical principles and practice of the arts and industry. The demand for such courses increased, nevertheless. It was evident that the old order of education was changing but at the time the new was not apparent. It was under the above conditions that the Massachusetts Agricultural College had its birth.

THE MORRILL ACT.

This demand for technical education finally crystallized into a bill known as the Morrill Act of 1862, endowing colleges for this purpose in every state of the Union. The original bill was framed by Senator Justin L. Morrill of Vermont and its final enactment obtained under his leadership. It provided that public land be assigned to the several states and territories, the funds from the sale of which were to be used to establish and maintain colleges of agriculture and mechanic arts. Although the main objective of such colleges was training in Agriculture and Mechanic Arts, they were to include other scientific and classical subjects in order to promote both the liberal and practical education of the industrial classes.

Massachusetts accepted the provisions of the Morrill Act in 1863 and immediately began to plan for a new college. The Massachusetts Institute of Technology was already organized, however, so it was decided that instruction in mechanic arts should be given there. For this reason the college, when founded, was one of agriculture only and today has the unique distinction of being the only separate agricultural college in the country. The General Court required that $75,000 be raised and presented to the Trustees by that town in which the college was to be located. Northampton, Lexington, Springfield and Amherst offered to comply with this request. After much discussion, Amherst was finally selected as the location and a tract of land containing 310 acres purchased for the college.

FOUNDING AND EARLY GROWTH OF THE COLLEGE.

The institution was formally opened to students October 2, 1867. At that time there were four teachers on the faculty and four wooden buildings on the campus. The number of students steadily increased during the first term and by December 47 had been admitted. Of these members of the pioneer class of 1871 several are still alive. These men have seen the whole development of education in scientific agriculture for, at the time of their entrance into the college, technical training in this field was merely an idea, not yet even in the experimental stage. From this rather modest beginning, the college has grown steadily, not only in the field of resident instruction, but in that of research and in extension. In a sense, experimental work is as old as the institution, for during its earliest years some very important investigations were carried on by the instructors. Research work was established as a separate unit, however, in 1882 when the state provided for the establishment of an agricultural experiment station. This station which was located at the college, was supplemented in 1887 by another, the Hatch Experiment Station, provided for under the Act of Congress establishing an experiment station in connection with agricultural colleges. These two stations were combined in 1895 and are now known as the Massachusetts Agricultural Experiment Station.

The scope of the college was further broadened with the establishment of the Extension Service. This aimed to make available to residents of Massachusetts useful and practical information in agriculture and home economics. It now serves those who are unable to take resident instruction in Amherst.

Present Scope of the College.

Thus, at the present, the college fulfills the three-fold purpose of instruction, research, and extension work.

The resident instruction in agriculture covers this field in its broadest sense.

The college curriculum as now organized permits one to specialize in one of five fields, Agriculture, Home Economics, Horticulture, Physical and Biological Science, and Social Science. At the same time the student must pursue certain courses in each of the other groups so that his education becomes truly "both liberal and practical."

For those who have neither the preparation, the time or desire to pursue a collegiate course leading to a degree there are provided certain non-collegiate courses in practical agriculture. The Stockbridge School of Agriculture, located on the campus, offers a two-year course in practical agriculture. In addition there is a winter school course and a vocational poultry course.

In addition to this resident teaching there is the research work which attempts to accumulate new information in the broad field of agriculture and home economics. This information in turn is disseminated about the state to those unable to receive it through resident instruction, through the medium of the Extension Service.

THE COLLEGE CAMPUS.

Hand in hand with this steady growth of the College, there has come a marked expansion in physical equipment. The original farm of 1867, with its run-down fields and degenerated apple orchards cut up here and there by old Virginia rail fences and hedge rows has metamorphosed during the last fifty years into one of the most attractive college campuses in New England. A brief statement of land, buildings and equipment will show to what extent the original four wooden buildings have been out-grown.

Location and Lands.

The Agricultural College is located in Amherst, a town of about six thousand people, overlooking one of the most picturesque sections of the Connecticut Valley. From the standpoint of teaching material in the field of science and agriculture, the location is ideal. Amherst is ninety-seven miles from Boston and may be reached by the Central Massachusetts division of the Boston & Maine Railroad, or by the Central Vermont Railroad. Electric cars also connect the town with Northampton, Holyoke, and Springfield. The campus consists of a tract of approximately seven hundred acres, lying about a mile north of the village center. In addition the college owns another area of seven hundred and fifty-five acres located about six miles north of the campus on Mount Toby. This is used for a demonstration forest.

Buildings and Equipment.

The campus is laid out in the form of an oval attractively set off by the college pond in the center. Around this oval are grouped the main buildings of the college. In the following list the buildings are presented in order about this oval.

South College. — Here are located the administrative offices, including the office of the President, Dean, Treasurer, Secretary, the Extension Service, Short Courses, and Women's adviser. The Department of Agricultural Economics also has offices here. The west wing is used as a men's dormitory. This accommodates about twenty students. Erected 1885.

North College. — This is a men's dormitory which accommodates about thirty-five students. In addition there are the offices of the Christian Association and the Inter-Church Student Secretary, together with a large Social Union room used for meetings and entertainments. This is one of the oldest buildings on the campus, having been erected in 1867.

Flint Laboratory. — The work in Dairy Manufactures is carried on here. The building is well equipped with modern machinery for the production of market milk, ice-cream, butter and cheese. In addition there are the laboratories of Horticultural Manufactures for the scientific and economical preservation of food. This building was erected in 1911 and was named in honor of Charles L. Flint, fourth president of the College.

Stockbridge Hall. — Here are located the departments of Agronomy, Animal Husbandry, Agricultural Engineering, Farm Management, Poultry Husbandry, Education and English. In addition to the lecture rooms and offices are laboratories for soil fertility, field crops, poultry, and a drafting room for engineering. The clothing and house furnishing laboratories for the Home Economics Department are also located here. In the rear of the building are the greenhouse and head house used by the Department of Agronomy for work on crops and soils. A special reference library for the Division of Agriculture is on the second floor. Bowker Auditorium, the largest auditorium on the campus, is also in this building. It has a seating capacity of nine hundred and is named in honor of William H. Bowker, a member of the first graduating class, later a Trustee of the College, and one of the pioneers in the fertilizer industry. Stockbridge Hall was erected in 1914 and named in honor of Levi Stockbridge, a former president and professor of Agriculture in the College.

Grinnell Arena. — Such work in Animal Husbandry as pertains to livestock judging and study is carried on in the Grinnell Arena. This building erected in 1910, is located near the livestock barns and is especially designed for judging work.

Rural Engineering Shop. — Included in this laboratory for students of Rural Engineering, located a short distance back of Stockbridge Hall, are a carpenter shop, general repair shop, and a laboratory for farm machinery and motors. The building was erected from 1916 to 1924.

Draper Hall. — The college dining hall is located in Draper. The main dining room has a seating capacity of three hundred and seventy. In addition there is a cafeteria in the west wing which can accommodate about ninety-five at one time. The capacity of the dining hall during a normal meal hour is about six hundred although as many as one thousand can be accommodated. There is a small banquet room on the second floor and several dormitory rooms. Erected 1902 and subsequently, and named in honor of James Draper, for twenty years a trustee of the college.

Goessmann Laboratory. — This is a modern chemical laboratory. The building is approximately two hundred feet by eighty feet and contains eight large laboratory rooms, a large auditorium, a chemical library, and lecture rooms. The east wing of the third floor is occupied by the research professors in Chemistry of the Experiment Station. In addition to the work in Chemistry the class work in German is held in this building. Goessmann Laboratory was erected in 1924 and named in honor of Charles A. Goessmann, the first professor of Chemistry at the college.

West Experiment Station. — The state control work is centralized here. Fertilizers, seeds, and feeds are analyzed or inspected in accordance with the state law, to determine whether or not they meet their guarantee. Erected 1886.

East Experiment Station. — The office of the Director of the Experiment Station and other administrative offices of the Experiment Station are located in this building.

Abigail Adams House. — This is a modern girls' dormitory accommodating about one hundred students. It was erected in 1919 and named for Abigail Adams, a staunch believer in farm life, the wife of John Adams, second President of the United States. In the rear of the building is a large athletic field used in connection with the physical training work of the women students.

Bacteriology and Physiology Laboratory. — This building, erected in 1915, is especially designed to carry on work in Bacteriology as it relates to soil, industry, dairying, foods and public health. There are four class laboratories, several private laboratory rooms and offices and a lecture room. In addition there are incubator rooms, sterilizing rooms, hood rooms, washing rooms, inoculating rooms, weighing rooms, an animal room, a photographic and dark room, and a sub-basement refrigerator room. There is also a well equipped library containing books and current periodicals useful in the conduct of bacteriological and physiological work and investigation.

Infirmary. — The Infirmary consists of two small cottages on the hillside in the rear of the Bacteriology Laboratory. They are especially designed to care for sick or injured students. A trained nurse is on duty at all times to assist in the needs of the patient.

Physics Building. — This is a small wooden building erected in 1867. It contains a well equipped laboratory for work in college Physics and also one lecture room.

Wilder Hall. — Here are located the departments for Landscape Gardening and Pomology. The building is chiefly devoted to classrooms, drafting rooms, and offices. It was erected in 1905 and named in honor of Marshall P. Wilder, a pioneer in the movement for agricultural education in Massachusetts and one of the first Trustees of the college.

Fisher Laboratory. — This is a well planned and equipped fruit packing and storage house. It includes six refrigerator rooms, four storage rooms not refrigerated, one large laboratory room, one class room besides ample storage space for fruit packages and equipment. The equipment for the building itself includes four types of apple sizers, packing tables and box and barrel presses of various types, besides all kinds of packages with smaller equipment necessary for thoroughly modern work in grading and packing fruit. This building is used by the Pomology Department and was named in honor of Jabez Fisher, one of the foremost, early horticulturists of the State. Erected 1910. Just east of Fisher Laboratory is the Horticultural Manufactures shed containing equipment for making cider, vinegar, and maple syrup.

French Hall. — French Hall houses the departments of Floriculture, Forestry, Horticulture and Vegetable Gardening. It is also the headquarters of the Northeastern Forest Experiment Station. The classroom work in Economics, Sociology, French and Spanish is also given here. Just to the rear of the building is the new Durfee range of greenhouses, devoted to the growing of carnations, roses, chrysanthemums, violets, etc. One house is maintained as a conservatory and contains a collection of plants used primarily for decorative purposes. Another house is devoted to greenhouse vegetables. The old Durfee range located just to the north of French Hall is used chiefly for the growing and maintenance of a collection of conservatory plants. There are also many of economic value such as the bamboo, camphor tree, guava, palm, etc. French Hall was erected in two sections; the first in 1908, the second in 1913. It was named in honor of Henry S. French, the first President of the college.

Clark Hall. — Here are located the offices, lecture rooms and laboratories of the Department of Botany. In addition to the main building, there is a greenhouse used for research and laboratory purposes. The herbarium contains about twenty thousand sheets of seed plants and ferns, twelve hundred sheets of liverworts and mosses and a collection of twenty-five thousand specimens of fungi. The office and laboratory of plant pathology of the Northeastern Forest Experiment Station also are located in this building. Erected in 1906 and named in honor of William S. Clark, President of the college and Professor of Botany from 1867 to 1879.

Fernald Hall. — This building, erected in 1909, was named in honor of Professor Charles H. Fernald, who served the college for twenty-four years, built up a strong department in Zoölogy, created the department of Entomology, and acted as Director of the Graduate School. Fernald Hall houses the Departments of Zoölogy, Geology, and Entomology. In addition to laboratories, lecture rooms, and offices, there is a Geological Museum, a Zoölogical Museum and a collection of over 160,000 insects. Material in these collections is available for study and for exhibition purposes. In the basement is located the cooking laboratory of the department of Home Economics.

Mathematics Building. — This is a small frame building containing classrooms for instruction in mathematics and surveying. There is also a well equipped drafting room, and a small one devoted to blue-printing.

Paige Laboratory. — The work in Veterinary Science is located in this building. In addition to the class, lecture, and laboratory rooms, there are the laboratories for the State Control and Research work on animal diseases. The museum contains a growing number of anatomical and pathological specimens most of which are used for teaching purposes. In the rear of the building are the stables for housing both laboratory and larger animals under isolation conditions for dissection, post mortem examinations and for incineration purposes. Paige Laboratory was erected in 1898 and named for James E. Paige, Professor of Veterinary Science from 1891 to 1922.

Drill Hall. — Here are located the offices of the Military and Physical Education Departments. Included is a basket ball floor, shower baths, lockers, and an indoor rifle range. The whole building was remodeled in 1927.

Alumni Field. — This tract of land was transformed into an Athletic Field, containing a baseball diamond, football field, and cinder track by the Alumni and friends of the college. Completed 1915.

Riding Park. — Just south of the Drill Hall is a small riding park used for exhibition purposes by the military unit.

Memorial Hall. — The social center of student life is Memorial Hall. It was erected by the Alumni, students, faculty and friends of the college in memory of those M. A. C. heroes who died in the World War. In the basement are bowling alleys, pool tables, a store, post office and barber shop. On the main floor are eight offices for the leaders of various student activities, a large reading room and a beautiful Memorial Room in which is found a tablet bearing the names of the sons of the college who gave their lives in the Great War. On the second floor is an auditorium seating 350 persons. This room is also used for college dances. Memorial Hall was erected in 1921.

Library. — This was originally the college chapel. It now contains one of the best agricultural libraries in the country. There are about 77,000 bound books together with a greater number of unbound books, pamphlets, magazines, etc. The collection covers the general field of agriculture, science, literature, history and sociology. The periodical file contains over 400 magazines and newspapers. The library is open during terms from 8 A.M. to 10 P.M. daily and from 10 A.M. to 1 P.M. Sundays, with shorter hours during vacation. This building was erected in 1885.

Power Plant. — Heat and light are supplied to all the buildings on the campus from a central power plant. This was erected in 1902 and has been subsequently remodeled.

Farm Buildings, Land and Equipment.

College Farm and Barns. — The college farm consists of 240 acres located just west of South College. Most of it is suitable for cultivation and is operated in regular rotation. Much of the farm as it now stands has been made productive by tile draining and clearing the land of brush and stumps. The principal crops raised are those which can be utilized by the livestock together with some cash crops such as cabbage, carrots, potatoes, and hay. For instructional work the farm is available for study in field crops, planning of crop rotation, practical field operation of farm machinery and tractors and farm management. The livestock of the farm consists of about 165 head of registered cattle which are excellent representatives of the Ayrshire, Guernsey, Holstein, Jersey, Milking Shorthorns, and Hereford breeds, a considerable number of registered Berkshire and Chester White swine, a flock of about 100 Shropshire and Southdown sheep and 20 Percheron horses. These animals are used chiefly for demonstrational and instructional work in feeding and herd management and in the teaching of correct types by much practice in judging. The farm buildings are model structures for their various purposes. They were erected in 1909 and subsequently. The dairy barns contain efficient and modern equipment for their respective purposes. The sheep barns and piggery are located several hundred yards down from the dairy barns.

Cavalry Stable. — This stable has a capacity for the sixty horses which are used by the M. A. C. Cavalry troop. This building is maintained by Federal expense. Erected in 1925.

Poultry Plant. — The college poultry plant consists of about twenty acres of land in addition to the various buildings that go to make up a modern poultry plant. Although only eight acres of the land comprising the plant are college-owned this quantity permits for a three-year growing rotation. The plant will accommodate 2,000 laying birds and has growing facilities for about 7,000 chicks. The incubator capacity of the plant is approximately 12,000 eggs at one time. Located about one-half mile east of the college on East Pleasant Street, is the experimental poultry farm which accommodates about 1,200 adult birds and has hatching facilities for about 3,000 chicks. Here experiments on breeding poultry for egg production and disease control are carried on under strict quarantine.

The Hatch Barns. — These structures house the live stock which have been segregated from the main herd and flocks for the purpose of experimentation work in connection with the subject of feed and feeding. Erected in 1891.

Experiment Station Barns. — These buildings contain the equipment and animals used in connection with the work of the Massachusetts Experiment Station.

Orchards and Vineyards. — The college orchard contains about 20 varieties of peaches, 25 of plums, 20 of pears, and 100 of apples. Common varieties of grapes are grown in the vineyards and with the various approved trellis systems. These orchards are used for teaching material in Pomology.

Vegetable Gardens. — Here are grown the class material used by the vegetable gardening department.

Mt. Toby Demonstration Forest. — This is an area of approximately 750 acres located on Mt. Toby. It contains the various types of forest growth found throughout the State. It serves as a field laboratory in forestry. Students have the privilege of working out problems in silviculture, forest mensuration and management. Improvement cuttings, cuttings for utilization and forest planning are conducted here also.

COURSES OF INSTRUCTION.

Collegiate Courses.

Four-Year Collegiate Course. — The degree of Bachelor of Science is granted to those students satisfactorily completing the four years' work of collegiate grade.

The field of instruction covers Agriculture, Home Economics, Horticulture, Physical and Biological Sciences and Social Science.

Graduate School. — Students with the necessary qualifications may register in the Graduate School. The degrees of Master of Science, Master of Agriculture, Master of Landscape Architecture, Doctor of Philosophy, and Doctor of Agriculture may be granted upon the completion of satisfactory study, research, and a thesis.

Summer School. — Both graduate and undergraduate courses are offered in the six weeks' summer school. Only courses of collegiate grade are offered. Credits earned may count toward the Bachelor of Science degree or advanced degrees.

Non-Collegiate Courses.

Several short courses of non-collegiate grade are offered to meet the needs of those both young and old who through lack of preparation cannot qualify for the college course, or who desire only practical training in the modern accepted methods of farming. These courses are planned to help the farmer and the housewife.

Stockbridge School of Agriculture. — The purpose of this school is to provide a two-year course in practical agriculture for those who cannot meet the entrance requirements of a college course or who for other reasons cannot enroll for collegiate work. Study in this school is not equivalent to study in the college. Subjects taken in the Stockbridge School of Agriculture cannot be used for college credit.

The Winter School. — Beginning about January first a ten weeks' winter school is given. Practical courses in agriculture and horticulture are offered and are so arranged that a student may choose such subjects as will enable him to specialize along the line of work in which he is most interested.

One-Year Vocational Poultry Course. — This course is designed for those who wish an intensive course preparing them for practical poultry raising.

STUDENT EXPENSES.

Deposit Requirements.

Admission.

All collegiate undergraduate students are required to make a deposit of five dollars at the time of filing application for admission to the College. This deposit will be considered as payment of the matriculation fee at time of registration. The deposit will be refunded to all applicants who are rejected by the College. Any applicant who is accepted by the College but who fails to matriculate will forfeit the deposit.

Dormitory Rooms.

All students who apply for dormitory accommodations are required to deposit ten dollars at the time of making application. In case no accommodation is available this deposit will be refunded. It will be refunded if the Dean is notified before August 20 that the room will not be occupied. Otherwise it will be credited to the account of the student's room rent.

Note. Make all checks or money orders payable to Treasurer, M. A. C.

Tuition. — Residents of Massachusetts are charged a tuition fee of $60 per year, payable in advance in three installments of $20 each on the first day of each term. For those who are not residents of Massachusetts, the tuition fee is $180 per year. Students entering from Massachusetts are required to file with the Treasurer a statement signed by either town or city clerk, stating that the applicant's father is a legal resident of Massachusetts.

Matriculation Fee. — All students entering the college for the first time as undergraduates, are charged a matriculation fee of $5.00 which in the event of a student leaving the institution is returned, if all bills due the college are paid, or is, upon graduation, considered as payment for the diploma.

Rooms for Men. — Dormitory accommodations for men are available for about 62 students. Drawings for these rooms are made the latter part of May. Practically all such rooms are assigned to upper classmen at that time. Freshmen usually obtain rooms in private dwellings located near the campus. In most cases these rent for from $2.50 to $4 per week, depending somewhat on location, and whether or not they are single or double. Such rooms are usually furnished. Students desiring aid in obtaining rooms should write to the Assistant to the Dean. The college does not secure these rooms for the student but does keep a desirable list for student aid.

Rooms for Women. — Dormitory accommodations for women are available at the college for 105 girls. Applications for rooms should be made to the Adviser of Women. A freshman cannot be assigned to a room at the dormitory until her entrance record has been accepted by the Dean. A deposit of $5 is required when a room is reserved. The rental is $33 to $39 per term. Rooms in the dormitory are furnished except for necessary bedding or linen. They are cared for by the students occupying them.

Board. — All freshmen are required to board at the college dining hall. Upper classmen either board here or at private dining places. All women students living in college dormitories are required to board at the dining hall. The cost of board at the dining hall is $255 per year payable as follows:

At the opening of college	$79 00
December 1	18 50
January 2	82 50
March 25	75 00

Rebates at the rate of $6 per week may be granted for absences in excess of one week. No rebates will be allowed for absences of less than one week, unless the absence is authorized by the Dean, and the rebate approved by the Treasurer.

Additional Expenses. — In addition to the above charges there are additional expenses, such as laboratory fees, a military uniform deposit for those taking military drill, expenditures for books and stationery and certain class assessments and taxes levied for the maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, and so on.

Initial Payments. — The initial payment required of freshmen by the Treasurer's Office at the time of fall registration varies from about $100 to $150 depending on whether or not the student takes military and has a room in the dormitory.

Summary of Expenses. — The following is a summary of expenses for the year. The student should realize that these are strictly college expenses and do not include amounts for clothing, traveling, etc., expenses which vary with the individual.

Estimate of College Expenses.

Tuition: citizens of Massachusetts, $60; others, $180 per year.

	Low	High
Tuition (citizens of Massachusetts)	$60 00	$60 00
Matriculation fee (first year)	5 00	5 00
Room in college dormitories or in private houses	39 00	140 00
Board, $7.50 per week (College Dining Hall)	255 00	255 00
Laundry, 50 to 85 cents a week	18 00	30 00
Laboratory fees	8 00	25 00
Books, stationery and miscellaneous item	40 00	60 00
	$425 00	$575 00

Graduation Requirement. — No student will be graduated unless all bills due the college are paid on or before the Wednesday preceding the graduation exercise. If paid after that date and otherwise eligible he may graduate the following year.

STUDENT EMPLOYMENT.

The college affords opportunity for part time employment for a limited number of needy students. The number of applicants for labor far exceeds the number that the institution can fill, however, so that no guarantee can be made that a student will find employment through the college. In many instances students find outside work through their own initiative. Among the permanent college positions are several janitorships. Forty or more students are employed at the dining hall. In addition the various college departments have work from time to time. Applications for student labor should be made to the Secretary of the College. Only those students are eligible for permanent campus employment whose need has been investigated by the employment committee and who have been certified as being eligible for such employment. Very few permanent campus positions are held by freshmen. For this reason freshmen are not advised to enter the college without at least $300 to $400 in cash; or enough to carry them the major portion of the year. Although they do find odd jobs about the college or town the amount of money that can be earned is usually small. Moreover, studies require practically all of the time of the beginning student. Students with insufficient funds are advised to work a year before entering college rather than attempt to carry too heavy a study and work load while in college. Those who elect military drill at the beginning of the junior year are paid by the Federal Government at the rate of 30 cents per day while in college.

SCHOLARSHIPS.

Scholarships are awarded only to needy students of high character, whose habits of life are economical and who have maintained an average of at least 70% in their college course during the preceding year. Scholarships may also be granted to applicants for admission to the college provided they are candidates for a degree, are in need of financial assistance and are able to meet the entrance requirements in full. Complete information relative to the student's need for financial aid must be presented before any application can be acted upon. Scholarships are paid in installments at the beginning of each term in the form of a credit on the student's bill for that term. A scholarship may be discontinued at the close of any term if the scholastic record of the recipient is unsatisfactory.

Blanks for applying for a scholarship may be obtained from the Dean of the college. Applicants from the three upper classes must file at the Dean's Office before the close of the college year an account of their income and expenses for that college year together with a statement of their resources for the coming year. Prospective freshmen may file their applications at the time their entrance requirements are satisfied in full.

The following scholarships are available:

1. General scholarships:
   a. Nineteen scholarships of $60 each known as the Porter L. Newton Scholarships.
   b. One scholarship of $60 known as the Mary Robinson Scholarship.
   c. One scholarship of $60 known as the Henry Gassett Scholarship.
   d. One scholarship of $60 known as the Whiting Street Scholarship.
2. Scholarships limited to students from Berkshire County:
   a. At least ten scholarships of $60 or more, known as the Frederick G. Crane Scholarships.
3. Scholarships limited to men students of Hampshire County:
   a. Several scholarships known as the Wilbur H. H. Ward Scholarships.

The above scholarships are made available through the income of the following funds:

The Wilbur H. H. Ward Educational Trust Incorporated.— This is a gift of $100,000 from Wilbur H. H. Ward. The income is available for the assistance of needy boys first from Amherst and then from Hampshire County who attend the Massachusetts Agricultural College. This fund is administered by a Board of Trustees not connected with the college.

Frederick G. Crane Fund.— The family of the late Frederick G. Crane of Dalton has presented to the Massachusetts Agricultural College a gift of $25,000 to establish a fund in memory of Frederick G. Crane, the income therefrom to be expended by the Trustees in aid of worthy undergraduate students of limited financial resources attending the college, preference being given to residents of Berkshire County.

Porter L. Newton Fund.— This is a gift of $23,411 from the late Porter L. Newton of Waltham.

The Whiting Street Scholarship Fund.— This is a gift of $1,000 of Whiting Street of Northampton.

Mary Robinson Fund.— This is a gift of $1,000 from Miss Mary Robinson of Medford.

Gassett Scholarship Fund.— This is a gift of $1,000 from Henry Gassett of Boston.

LOANS.

Loans may be granted to needy students requiring some assistance in meeting the expenses of the college course. The student must present a properly endorsed note at the time a loan is made. Money thus loaned is at a low rate of interest until the student graduates or severs his connections with the college. Applications for a loan may be made at the Dean's Office.

These loans are made available through the income from the following funds:

Danforth Keyes Bangs Fund. — This is a gift of $6,000 from Louisa A. Baker of Amherst, the income of which is to be used annually in aiding poor, industrious and deserving students to obtain an education in the Massachusetts Agricultural College.

Charles A. Gleason Fund. — This is a gift of $5,000 from Charles A. Gleason of North Brookfield, Massachusetts, a trustee of the college from 1889 to his death September 29, 1925.

Massachusetts Agricultural Club Fund. — The Massachusetts Agricultural Club has given $500 to be used as a loan fund at the Massachusetts Agricultural College to help out deserving students there who intend to go into agricultural work.

4-H Club Loan Fund for Boys. — A loan fund of $1,000.

4-H Club Loan Fund for Girls. — A loan fund of $100.

PRIZES AND AWARDS.

Prizes are offered annually in several departments for excellence in study and for other special achievements. The prizes offered in 1928 were:

The Grinnell Prizes. — Given by the Hon. William Claflin of Boston, in honor of George B. Grinnell, Esq., of New York, for excellence in theoretical and practical agriculture. The contest is open to those senior students whose records on the registrar's books show an average standing of 80 or above for the technical work taken in the Divisions of Agriculture and Horticulture during the junior and senior years. There are three prizes of $25, $15, and $10.

The Burnham Prizes. — These were made possible through the generosity of Mr. T. O. H. P. Burnham of Boston. Prizes of $15 and $10 are awarded to those students delivering the best and second best declamations in the Burnham contest. The preliminary contests are open under certain restrictions to freshmen and sophomores.

The Flint Prizes. — The Flint Oratorical Contest was established in 1881 by a gift of the late Charles S. Flint, a former trustee of the college. After his death the prizes were continued by college appropriation. Prizes of $30 and $15 are awarded as first and second prizes to those two students delivering the best orations in this contest.

The Hills Botanical Prize. — This is given through the generosity of Henry F. Hills of Amherst, for the first and second best herbaria. Competition is open to members of the senior, junior and sophomore classes. First prize $20, second prize $15.

The Allan Leon Pond Memorial Medal. — This medal is awarded for general excellence in football in memory of Allan Leon Pond of the class of 1920, who died February 26, 1920. He was a congenial companion, a devoted lover of Alma Mater, a battle-scarred, though youthful, veteran of the Great War, a fine all round athlete and a true amateur. He would rather win than lose, but he would rather play fair than win. He has been characterized as a typical "Aggie" man.

The Frederick Cornelius Eldred Memorial Athletic Prize. — This is a prize established by Frederick Cornelius Eldred of the class of 1873, famous oarsman and pioneer in athletics at M. A. C., who trained, coached and stroked crews for inter-collegiate races — two to victory. "A prize of one hundred dollars may be awarded at Commencement to that member of the senior class who has represented the college in intercollegiate athletic contests for a period not less than two years and who has attained the highest average standing in scholarship during his course."

Academic Conspicuous Service Trophy. — This trophy is awarded to that student who, during the past 12 months has made the most important, single contribution, to the Academic Activities.

The Southern Alumni Baseball Cup. — This cup is awarded to that member of the baseball team who contributes most to the success and reputation of the team, both in respect to skill and spirit.

Phi Kappa Phi Elections. — Those members of the senior class whose scholarship average has been 85 or above are eligible for election to the Honorary

Scholarship Society of Phi Kappa Phi. Not more than 15% of the class can be elected, however.

Phi Kappa Phi Award for Scholarship. — Massachusetts Chapter of the Phi Kappa Phi Honorary Scholarship Society offers an award for outstanding work in scholarship. This is given to some member of the Senior class at the opening of college in the fall. The award is based on the record of the first three years. For the college year 1927–1928 this scholarship was $250.

STUDENT ACTIVITIES AND ORGANIZATIONS.

No small part of the value received from four years of college is the training that one acquires through participation in student activities. Student organizations offer excellent opportunities for leadership in a wide variety of fields.

Student Government.

The Senate. — This is a student governing council. It is composed of representatives elected from the Junior and Senior classes. Besides acting as general director of undergraduate conduct it represents the interests of the students and the student body before the Faculty.

Adelphia. — This is a senior honorary society. The members are usually chosen from those who have been prominent in college activities. The society attempts in a quiet, unassuming way to mold student life on the campus.

The Honor Council. — The Honor System prevails at this college. The foreword of the Honor System reads as follows: "We, the students of the Massachusetts Agricultural College, believe that the goal of education is character. The man of character deals fairly with himself, and with others, and would rather suffer failure than stoop to fraud. The Honor System stands for this attitude in all relations of the students with the Faculty. In expression of our belief we pledge ourselves to the support of the constitution of the Honor System." Matters pertaining to the Honor System are in direct charge of the Student Honor Council, consisting of members elected from the four classes.

The Women's Student Council. — All appropriate matters pertaining to the conduct of women students are under the control of this council. It is composed of members selected from the senior, junior, and sophomore classes by all the women students.

College Publications.

The Massachusetts Collegian. — This is a weekly newspaper, published by the undergraduates of the college.

The Index. — This is the college yearbook published by the members of the Junior class.

The Alumni Bulletin. — This is the official organ of the Alumni of the college. It is issued from the office of the Alumni Secretary.

College Fraternities.

There are several national and local fraternities represented on the campus. Rushing rules and general matters dealing with fraternity life are in charge of the Inter-fraternity Conference. This conference awards scholarships, a baseball cup, and a relay placque to the winners of the Inter-fraternity Contests.

Academic Activities.

The College Musical Clubs include an orchestra, a Girls' Glee Club, and a Boys' Glee Club. These give a number of concerts during the year, both in Amherst and on tour.

The Dramatic Club, the Roister Doisters, presents annually a revue and two plays, one in connection with the Junior Promenade, and the other at Commencement. There is a Debating Society which conducts both class and intercollegiate debates. All academic activities are supervised by the Academic Activities Board composed of Alumni, Faculty, and students.

Inter-Collegiate Athletics.

The College is represented in inter-collegiate athletics by teams in all the leading sports, including football, baseball, track, hockey, and basketball. General policies governing athletics are in charge of the Athletic Board, composed of Alumni, Faculty, and students.

Professional Clubs.

There are several professional clubs established in connection with the major work of the college. Included among these is an Animal Husbandry Club, Landscape Art Club, Pomology Club, Agricultural Economics Club, and Floricultural Club.

Religious Organizations.

The Young Men's Christian Association and the Young Women's Christian Association are active both on the campus and off. In addition there is a Catholic Club, and a Jewish Menorah Society. The Cosmopolitan Club has as its object the cultivation of peace and the establishment of strong international friendship.

The Social Union.

The Social Union was established in 1907. All students become members of the Union by paying a small fee. In the fall and winter months the Union gives a series of entertainments.

HEALTH PROGRAM.

Physical Examinations. — All men students entering as freshmen are required to undergo a physical examination upon arrival at college. This examination is given during matriculation week. All women students entering as freshmen are required to present a health certificate. This involves a physical examination before coming to college.

The College Infirmary. — The college endeavors to safeguard the health of the students while on the campus. A resident nurse is on duty at the Infirmary at all times. Students are urged to go to the Infirmary at any time that they are in need of the services of such a nurse or of those of a town physician. Inasmuch as the Physical Director gives special attention to all student diseases it is to be expected that the majority of the students will go to the infirmary at his suggestion. This understanding should in no way deter students from going voluntarily at any time. Students are urged to consult the Physical Director or the resident nurse immediately when signs of physical disorder appear. Severe attacks of cold or other forms of illness can usually be avoided if treatment is administered in the incipient stage. The purpose of the infirmary is to help maintain the general good health of the students, as well as to furnish a suitable place for professional attention in cases of severe illness or accident. The infirmary fee will be at the rate of $2 per day and will be charged when one or more meals are obtained at the infirmary, or when the student remains at the infirmary for one or more nights. A nominal charge will be made to out-patients for miscellaneous treatment of a minor character. In addition to the above fees, additional expenses may be charged to the patient under certain conditions. In case a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient, but the nurse will be under the general supervision of the resident nurse. If a student requires medical attention by a physician he will be required to select his physician and become responsible for fees charged by the physician. Special medical supplies prescribed by a physician or nurse will be charged to the patient. Expense for personal laundry incurred by students while in the infirmary will also be charged to the individual student.

FRESHMAN REGISTRATION.

All members of the incoming freshman class are required to be in residence on the campus for the period September 16 to September 21, 1929, inclusive. This period is known as Freshman Week. During this week will be given the several psychological examinations and tests required of freshmen. In addition physical examinations will be given to the men students. Such matters as pertain to schedule and section assignments will be taken care of at the same time. Lectures on student activities, college customs, and college curriculum will be given also. The object of this week is to introduce the new student into the college, so that only the minimum amount of time will be lost when the actual studies begin.

STUDENT RELATIONS.

The customary high standard of college men and women in honor, manliness, self-respect and consideration for the rights of others constitutes the standards of student deportment.

The privileges of the college may be withdrawn from any student at any time, if such action is deemed advisable.

It should be understood that the college, acting through its president or any administrative officer designated by him, distinctly reserves the right, not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may also be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences ("cuts"). According to the rules a student is allowed a certain percentage of absences from class and other exercises. This permission, which implies a privilege and not a right, may be withdrawn at any time for any cause.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet, if in the judgment of the college authorities, a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct. Prospective students or their parents may, upon application, obtain a copy of the faculty rules governing student relations to the college.

SPECIAL APPOINTMENTS AT BOSTON.

A representative of the college will be at the State House in Boston, the second and fourth Thursday of each month from 1.30 to 4 o'clock in the afternoon. Any one desiring information in regard to entrance, courses, or other matters pertaining to college instruction can obtain a personal interview at that time by calling at the information office of the Department of Education. No guarantee of an interview is made, however, unless the appointment has been arranged for in advance by writing to the Dean of the College at Amherst, Massachusetts.

Admission to Collegiate Courses.

A. APPLICATION FOR ADMISSION.

Correspondence concerning admission should be addressed to the Dean's office.

Every applicant for admission to the college must be at least sixteen years old, and must present to the Dean proper testimonials of character, which, when ever possible, should come from the principal of the school at which the applicant has prepared for college. Candidates who desire to present themselves for examination in any subjects must make application to the college for such privilege at least one month before the date of the examination. Blanks for such application may be obtained by addressing the Dean of the college. All entrance credentials must be in the hands of the Dean before the applicant can matriculate.

B. MODES OF ADMISSION.

Students are admitted to the freshman class either upon certificate or upon examination. No *diploma* from a secondary school will be accepted.

Certificates. — The Massachusetts Agricultural College is affiliated with the New England College Entrance Certificate Board. Therefore certificates of admission will be accepted from schools approved by the Board. Certificates of admission will also be accepted from any Massachusetts school listed as class "A" by the State Department of Education, but not included in the approved lists of the New England College Entrance Certificate Board. Principals of schools in New England who desire the certificate privilege should address the secretary of the Board, Professor Frank W. Nicolson, Wesleyan University, Middletown, Conn. Certificates from schools outside of New England may be received if those schools are on the approved list of the leading colleges of the section in which the school in question is located.

The credentials of the Board of Regents of the State of New York are accepted as satisfying the entrance requirements of this college when offered subject for subject provided the grades are satisfactory.

Certificates in order to be accepted must present in the prescribed and restrictive elective groups at least three of the necessary fourteen and one-half units. It is to be understood, however, that responsibility for certification in either elementary French, elementary German, English 1 or English 2, Latin A, Greek A or Algebra must be assumed by one school, if the candidate has received his preparation in any one subject named above in more than one school. Subjects lacking on certificate must be made up at the time of the examinations for admission. Conditions to the amount of two units will be allowed.

Special Certificate Arrangement for Students from Agricultural Schools. — Superior graduates of Vocational Schools of Agriculture in Massachusetts and Vocational Agricultural Departments in Massachusetts High Schools may be accepted for the Degree of Vocational Agriculture provided: —

(*a*) they are unqualifiedly recommended by the Vocational Division of the Department of Education as *bona fide* Vocational Graduates with superior rank; and (*b*) that they can present at least 14½ units of certified entrance, approved as to quality and quantity by the State Department of Vocational Education.

Blank forms for certification — sent to principals or school superintendents only — may be obtained on application to the Dean of the college.

C. EXAMINATIONS.

Entrance examinations for admission to the Massachusetts Agricultural College will be held at the following centers: —

In June	Amherst, Stockbridge Hall, room 114. Cambridge, Massachusetts Institute of Technology.
In September	Amherst, Stockbridge Hall, room 114.

Please note that September examinations are held in Amherst only.

Schedule for Entrance Examinations June 13–15, 1929.

First Day.

8.30 A.M.	Algebra.
10.30 A.M.	Chemistry.
2.00 P.M.	History (ancient, medieval and modern, English, United States and Civics).

Second Day.

8.30 A.M.	English 1 and 2.
11.30 A.M.	Botany and Biology.
2.00 P.M.	Plane Geometry.
3.30 P.M.	Physics.

Third Day.

8.30 A.M.	French, German, Spanish, required and elective.
1.00 P.M.	Latin, elementary, intermediate and advanced, and all one-half credit electives, except those already noted.

Schedule for Entrance Examinations September 11–14, 1929.

First Day.

2.15–5.00 P.M.	Greek, elementary and intermediate.

Second Day.

8.30 A.M.	Algebra.
10.30 A.M.	Chemistry.
2.00 P.M.	History (ancient, medieval and modern, English, United States and Civics).

Third Day.

8.30 A.M.	English 1 and 2.
11.30 A.M.	Botany and Biology.
2.00 P.M.	Plane Geometry.
3.30 P.M.	Physics.

Fourth Day.

8.30 A.M.	French, German, Spanish, required and elective.
1.00 P.M.	Latin, elementary, intermediate and advanced, and all one-half credit electives, except those already noted.

D. REQUIREMENTS FOR ADMISSION.

The requirements for admission are based on the completion of a four-year high school course or its equivalent and are stated in terms of units. A unit is the equivalent of at least four recitations a week for a school year.

Fourteen and one-half units must be offered for admission in accordance with the entrance requirements outlined below. In some instances students are allowed to enter conditioned in not more than two units.

Entrance Requirements.

1. *Prescribed.* — The following units are required.

Algebra	1½
Plane Geometry	1
English 1 (Grammar and Composition)	2
English 2 (Literature)	1
History	1
A foreign language	2
	8½

2. *Restricted electives.* — From two to six units selected from the following subjects: —

Mathematics and Science.

Solid Geometry	½
Trigonometry	½
Biology [1]	1
Botany [1]	½ or 1
Chemistry [1]	1
Geology	½
Physical Geography	½
Physics [1]	1
Physiology	½
Zoölogy [1]	½

History.

Ancient	1
English	1
Medieval and Modern	1
United States and Civics	1

Foreign Language.

Elementary French	2
Elementary German	2
Elementary Spanish	2
Elementary Latin	2
Elementary Greek	2
Intermediate French	1
Intermediate German	1
Intermediate Spanish	1
Intermediate Latin	1
Intermediate Greek	1
Advanced French	1
Advanced German	1
Advanced Spanish	1
Advanced Latin	1

3. *Free margin electives* — not over four units. In case fourteen and one-half units cannot be presented in the prescribed and restricted elective groups, units not to exceed four may be offered as free margin electives. Credit in the free margin will be allowed for any substantial courses (agriculture, general science

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[1] NOTEBOOKS. — The keeping of a notebook is required as part of the preparation in those subjects indicated. Candidates presenting themselves for examination in such subjects must present at the same time a statement signed by the Principal to the effect that a satisfactory notebook has been kept by the candidate.

and fourth year English included) not listed under the prescribed and restricted elective groups for which credit of not less than one-half unit earned in one year is given toward a secondary school diploma. Since no entrance examinations are given in these subjects they may be offered only on certificate.

E. OTHER INFORMATION ABOUT ENTRANCE.

1. If elementary algebra and plane geometry are counted as three units the total requirement for admission will be fifteen.
2. Both the credits under the prescribed and restricted elective groups must be presented either by certificate from an approved school or by examination or by a combination of both. Credit by certificate will not be accepted unless at least three units are offered.
3. Candidates are allowed to spread their entrance examinations over the three consecutive periods just previous to their entrance into college. A period means June to September of the same year.
4. Examinations for the removal of entrance conditions will be held during the first week of the second term.
5. All entrance conditions must be satisfied before a student is permitted to enter upon the work of the sophomore year.
6. The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable, regardless of whether entrance was gained by certificate or examination.
7. The passing grade for an entrance examination is 60 per cent.

F. ADMISSION TO ADVANCED STANDING.

A student desiring to transfer to this college from another of recognized standing must present the following credentials: —

1. A letter of honorable dismissal from the institution with which he has been connected.
2. A statement or certificate of his entrance record.
3. A statement from the proper officer showing a complete record of his work while in attendance.
4. A marked catalogue showing the courses pursued.
5. A statement from the proper officer, giving the total number of credits required for graduation by the institution from which the applicant is transferring, and, of this total, the number that the applicant has satisfactorily completed at the time of transfer.

The above credentials must be sent directly from the Registrar's office of the college from which the student is transferring. They should be addressed to the Dean of the Massachusetts Agricultural College. Applications will be judged wholly on their merits. The college may prescribe additional tests before accepting applicants or determining the standing to be granted them.

At least one year's work in residence is required of any student desiring to be recommended for the Bachelor of Science degree.

G. STATEMENT OF PREPARATION REQUIRED FOR ADMISSION.

AGRICULTURE.

Entrance credit in agriculture is granted on the following basis: —

I. The Massachusetts Agricultural College accepts a maximum of four units in agriculture from any secondary or county agricultural high school in Massachusetts offering work in that subject, provided evidence of such work having been done is submitted on a principal's statement, as is indicated in the "free margin" group.

II. In high schools organizing agricultural club work under the supervision and rules of the junior extension service of the college, one credit is granted for each full year of work performed under the following plan: —

Work of the Winter Term. — (*a*) The study of textbooks such as are suitable for secondary school instruction in agriculture.

(*b*) Course of study: A general outline of suggested topics for study.

(*c*) Visits by a representative of the Massachusetts Agricultural College for observation, counsel and advice in regard to kind and amount of work being done in agriculture.

(*d*) Formation of an agricultural club with officers from among its own members, meeting once a month under local supervision of some one authorized to act for the school authorities.

Work of the Spring Term. — Same in general form as winter term.

Work of the Summer Term. — An approved project conforming to the rules of some one or more of the agricultural clubs of the junior extension service of the Massachusetts Agricultural College.

Work of the Fall Term. — (*a*) An exhibit of work.

(*b*) Reports and story of achievement submitted to the junior extension service of the college.

BIOLOGY.

The entrance examination in biology will cover the work outlined by the College Entrance Examination Board. This work should extend through one full year and include both laboratory and textbook study. The requirements are met by Hunter's *Civic Biology* and similar texts. A certificate stating that a satisfactory notebook has been prepared is required.

BOTANY.

For one unit of credit in botany, the work outlined in the statement of requirements issued by the College Entrance Examination Board, or its equivalent, will be accepted. This work should occupy one school year and include laboratory and supplementary textbook study. For one-half unit of credit, work that covers the same ground but occupies half the time required for a full unit of credit will be accepted. These requirements are met by such texts as Stevens' *Introduction to Botany* and Bergen & Davis' *Principles of Botany*. A notebook, containing neat, accurate drawings and descriptive records forms part of the requirement for either the half-unit or the one-unit credit, and this notebook must be presented by all applicants for admission upon examination in this subject. The careful preparation of an herbarium is recommended to all prospective students of this college, although the herbarium is not required.

CHEMISTRY.

The entrance examination in chemistry will cover the work outlined by the College Entrance Examination Board as preparatory for college entrance. In general, this consists of a year of high school chemistry from any standard textbook, with laboratory work on the properties of the common elements and their simpler compounds. No particular work is prescribed. The keeping of a notebook is required.

A certificate stating that a satisfactory notebook has been kept should be submitted at the time of examination. In such a case it is not necessary to present the notebook. If the notebook is presented it must be certified.

Students who do not take chemistry in the preparatory school begin the subject in college.

MATHEMATICS.

(a) *Required.* — Algebra: The four fundamental operations for rational algebraic expressions; factoring, determination of highest common factor and lowest common multiple by factoring; fractions, including complex fractions; ratio and proportion; linear equations, both numerical and literal, containing one or more unknown quantities; problems depending on linear equations; radicals, including the extraction of the square root of polynomials and numbers; exponents, including the fractional and negative; quadratic equations, both numerical and literal; simple cases of equations with one or more unknown quantities that can be solved by the methods of linear or quadratic equations; problems depending upon quadratic equations; the binomial theorem for positive integral exponents, the formulas for the *n*th term and the sum of the terms of arithmetic and geometric progressions, with applications.

Plane Geometry: The usual theorems and constructions of good textbooks, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle; the solution of numerous original exercises, including loci problems; applications to the mensuration of lines and plane surfaces.

(*b*) *Elective.* — Solid Geometry: The usual theorems and constructions of good textbooks, including the relations of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders and cones; the sphere and spherical triangle; the solution of numerous original exercises, including loci problems; applications to the mensuration of surfaces and solids.

Plane Trigonometry: A knowledge of the definitions and relations of trigonometric functions and of circular measurements and angles; proofs of the principal formulas and the application of these formulas to the transformation of the trigonometric functions; solution of trigonometric equations, the theory and use of logarithms, and the solution of right and oblique triangles.

PHYSICS.

To satisfy the entrance requirement in physics, the equivalent of at least one unit of work is required. This work must consist of both classroom work and laboratory practice. The work covered in the classroom should be equal to that outlined in Hall & Bergen's *Textbook of Physics* or Millikan & Gale; the laboratory work should represent at least thirty-five experiments involving careful measurements, with accurate recording of each in laboratory notebook. This notebook, certified by the instructor in the subject, must be submitted by each candidate presenting himself for examination in physics; credit for passing the subject will be given on laboratory notes and on the examination submitted. Candidates entering on certificate will not be required to present notebooks, but the principal's certification must cover laboratory as well as classroom work.

PHYSIOLOGY.

Hough & Sedgwick's *The Human Mechanism;* Martin's *The Human Body; Briefer Course.*

ZOOLOGY, PHYSICAL GEOGRAPHY, GEOLOGY.

The following suggestions are made concerning preparation for admission in the subjects named above: —

For physiography, Davis' *Elementary Physical Geography;* Gilbert & Brigham's *Introduction to Physical Geography.* For zoölogy, textbooks entitled *Animals* or *Animal Studies,* by Jordan, Kellogg and Heath; Linville & Kelley's *A Textbook in General Zoölogy.* For geology, A. P. Brigham's *A Textbook of Geology* or Tarr's *Elementary Geology.*

Applicants for examination in zoölogy are *required* to present certified laboratory notebooks; applicants for examination in the other subjects are *advised* to present notebooks, if laboratory work has been done. Good notebooks may be given credit for entrance. Examination in these subjects will be general in recognition of the different methods of conducting courses; but students will be examined on the basis of the most thorough secondary school courses.

HISTORY.

The required unit must be offered in either ancient history, medieval and modern history, English history, or United States history and civics. Either one, two or three elective units in any of the historical subjects here named may be offered, provided that no unit be offered in the same subject in which the required unit has been offered.

Preparation in history will be satisfactory if made in accordance with the recommendations of the committee of seven of the American Historical Association, as outlined by the College Entrance Examination Board. The examination will require comparisons and the use of judgment by the candidate rather than the mere use of memory, and it will presuppose the use of good textbooks, collateral reading and practice in written work. Geographical knowledge may be tested by requiring the location of places and movements on outline maps.

To indicate in a general way the character of the textbook work expected, the texts of the following authors are suggested: Botsford, Morey or Myers, in ancient history (to 814 A.D.); Adams, West or Myers, in medieval history; Montgomery, Larned or Cheyney, in English history; Fiske, together with MacLaughlin or Montgomery, in United States history and civics.

ENGLISH.

The study of English in school has two objectives of equal importance: first, the ability to use the English language, in both speech and writing, clearly, correctly and effectively; and, second, the ability to read English literature with understanding and appreciation.

(1) *Grammar and Composition* (Two Units).—The first objective makes necessary a rigorous and reiterated instruction in grammar and composition, with special emphasis upon: spelling, sentence structure, punctuation and paragraph development. College freshmen are found deficient particularly in these fundamental phases of rhetoric.

(2) *Literature* (One Unit).—The second objective is sought by means of two lists of books, designated as *Books for Reading* and *Books for Study,* from which may be selected material for a progressive, four-year course in literature. The student should be trained to read aloud, to memorize significant passages, to associate the books with their historic background and to have well in hand both content and structure. He should be prepared for general examination on the former list and detailed examination on the latter. However accurate in subject matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling or other essentials of good usage.

LISTS OF BOOKS FOR 1929–1931.

1. *Books for Reading.*

From each group two selections are to be made, except that for any book in Group V a book from any other may be substituted.

Group I.

Cooper: *The Last of the Mohicans.*
Dickens: *A Tale of Two Cities.*
George Eliot: *The Mill on the Floss.*
Scott: *Ivanhoe* or *Quentin Durward.*
Stevenson: *Treasure Island* or *Kidnapped.*
Hawthorne: *The House of the Seven Gables.*

Group II.

Shakespeare: *The Merchant of Venice, Julius Caesar, King Henry V, As You Like It, The Tempest.*

Group III.

Scott: *The Lady of the Lake.*
Coleridge: *The Ancient Mariner;* and Arnold: *Sohrab and Rustum.*
A collection of representative verse, narrative and lyric.
Tennyson: *Idylls of the King* (any four).
The Æneid or *The Odyssey* in a translation of recognized excellence with the omission, if desired, of Books I–V, XV, and XVI of *The Odyssey,* or the *Iliad* with the omission, if desired, of books XI, XIII, XV and XXI.
Longfellow: *Tales of a Wayside Inn.*

Group IV.

The *Old Testament* (the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings and Daniel, together with the books of Ruth and Esther).

Irving: *The Sketch Book* (about 175 pages).
Addison and Steele: *The Sir Roger de Coverley Papers.*
Macaulay: *Lord Clive* or *History of England,* Chapter III.
Franklin: *Autobiography.*
Emerson: *Representative Men.*

Group V.

A modern novel.
A collection of short stories (about 150 pages).
A collection of contemporary verse (about 150 pages).
A collection of scientific writings (about 150 pages).
A collection of prose writings on matters of current interest (about 150 pages).
A selection of modern plays (about 150 pages).

All selections from this group should be works of recognized excellence.

2. Books for Study.

One selection is to be made from each of Groups I and II, and two from Group III.

Group I.

Shakespeare: *Macbeth, Hamlet.*

Group II.

Milton: *L'Allegro, Il Penseroso,* and either *Comus* or *Lycidas.*
Browning: *Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa — Down in the City, The Italian in England, The Patriot, The Pied Piper, De Gustibus, Instans Tyrannus, One Word More.*

Group III.

Burke: *Speech on Conciliation with America.*
Macaulay: *Life of Johnson.*
Lowell: *Democracy.*
Lincoln: *Speech at Cooper Union, his Farewell to the Citizens of Springfield, his brief addresses at Indianapolis, Albany and Trenton, the speeches in Independence Hall, the two Inaugural Addresses, the Gettysburg Speech, and his Last Public Address, together with a brief memoir or estimate of Lincoln.*
Carlyle: *Essay on Burns,* with a brief selection from Burns's poems.

FRENCH.

Elementary: The necessary preparation for this examination is stated in the description of the two-year course in elementary French recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year French (elective subjects for admission). — For a third unit in French as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth unit, the work described as "advanced" is expected.

No examination for a third unit in French will be given unless the candidate has presented elementary French on certificate, or has written the examination in elementary French.

No examination for a fourth unit in French will be given unless the candidate has presented both elementary and intermediate French upon certificate, or has written the examination in both elementary and intermediate French.

GERMAN.

Elementary: The entrance requirements in German conform to those of the College Entrance Examination Board for elementary German (the standard two-year requirements).

Third and fourth year German (elective subjects for admission). — For a third unit in German as an elective subject for entrance, when required units have been offered in German, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth unit, the work described as "advanced" is expected.

No examination for a third unit in German will be given unless the candidate has presented elementary German upon certificate, or has written the examination in elementary German.

No examination for a fourth unit in German will be given unless the candidate has presented both elementary and intermediate German upon certificate, or has written the examination for both elementary and intermediate German.

SPANISH.

Elementary: The necessary preparation for this examination is stated in the description of the two-year course in elementary Spanish recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year Spanish (elective subjects for admission). — For a third unit in Spanish as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth unit, the work described as "advanced" is expected.

No examination for a third unit in Spanish will be given unless the candidate has presented elementary Spanish on certificate, or has written the examination in elementary Spanish.

No examination for a fourth unit in Spanish will be given unless the candidate has presented both elementary and intermediate Spanish upon certificate, or has written the examination in both elementary and intermediate Spanish.

GREEK.

Elementary — Greek grammar and composition: Translation into Greek of short sentences illustrating common principles of syntax.

The examination in grammar and prose composition will be based on the first four books of Xenophon's *Anabasis.*

Intermediate: Homer's *Iliad,* Books I and II (omitting Book II, 494 to end), and the Homeric forms, constructions, idioms and prosody.

Prose composition, consisting of continuous prose based on Xenophon, and other Attic prose of similar difficulty.

Translation of passages of Homer at sight.

The examinations in Greek, elementary and intermediate, will be given in September only.

LATIN.

Elementary: Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (*a*) the translation of a passage or passages taken from Cæsar's *Gallic War,* covering at least four books, and (*b*) the translation of passages of Latin prose at sight.

Intermediate: Cicero (third oration *Against Catiline* and the orations *For Archias* and *For Marcellus*) and sight translation of prose.

Advanced: Vergil (*Æneid,* II, III and VI) and sight translation of poetry.

Collegiate Course of Instruction

The course of study consists of four years of work planned to provide scientific foundation, cultural background, and professional training, and leads to the degree of Bachelor of Science (B.S.). Except for a choice between French and German, the work of the freshman year consists of definitely required subjects.

The work of the sophomore year is also largely prescribed in order to insure a proper breadth of view of the several fields of study from which the student may select his further college work. Each student at the end of his freshman year selects one of the following major groups: Agriculture, Horticulture, Home Economics, Physical and Biological Sciences, or Social Sciences, and, under the guidance of a major group advisory committee, supplements the prescribed work of the sophomore year with certain elective courses which will best prepare him for further pursuit of this major course of study.

The work of the junior and senior years is, with certain restrictions, elective under the guidance of a special adviser, who is a member of the advisory committee of the major group which the student selects at the close of his freshman year as his field for professional training.

FRESHMAN YEAR.

Table of Freshman Subjects.

[Groups A and B of each term are required of all freshman men; groups A and C of all freshman women. For details, see the description of the courses and the following table.]

Groups.	Term I.	Term II.	Term III.
A	Agriculture 1 Chemistry 1 or 4 English 1 Modern Language (French or German) Mathematics 1	Agriculture 2 Chemistry 2 or 5 English 2 Modern Language (French or German) Mathematics 2	Agriculture 3 Botany 3 English 3 Modern Language (French or German) Mathematics 3
B	Military 1 (or Physical Education 7) Physical Education 1 Physical Education 2	Military 2 (or Physical Education 8)	Military 3 (or Physical Education 9) Physical Education 3
C	Home Economics 1 Physical Education 4	Physical Education 5	Agriculture 6 Physical Education 6

SOPHOMORE YEAR.

Table of Sophomore Subjects.

[Groups A and B of each term are required of all sophomore men; groups A and C of all sophomore women. In addition each student will, with the guidance of his major advisory committee, select each term two additional courses (normally of three credits each). These elective courses should be so chosen as to insure breadth of training and proper prerequisites for the courses to be elected in the major group for the junior and senior years. For details, see the description of the courses (pages 44–97) and the following table.]

Groups.	Term I.	Term II.	Term III.
Required A	English 25 English 28 Economics 25 Physics 25 or Zoölogy 26	English 26 English 29 Agricultural Economics 26 Botany 25	English 27 English 30 History 30 Physics 27 or Physiology 33
B	Military 25 (or Physical Education 30) Physical Education 25	Military 26 (or Physical Education 31)	Military 27 (or Physical Education 32) Physical Education 26
C	Physical Education 27	Physical Education 28	Physical Education 29
Elective	Agronomy 25[1] Agricultural Engineering 34[1] Drawing 25[3] Horticulture 25[3] Entomology 26[3] Physics 25[4] Zoölogy 26[2,4] French 1, 25, 28[5] German 1, 25, 28[5] History 28[5] Sociology 27[5] Home Economics 25[2] Home Economics 28[2]	Animal Husbandry 25[1] Agricultural Engineering 35[1,3] Drawing 26[3] Drawing 30[2] Horticulture 26[3] Bacteriology 30 Chemistry 25 Chemistry 30[2] Mathematics 26 Physics 26 French 2, 26, 29[5] German 2, 26, 29[5] History 25[5] History 29[5]	Agronomy 27[1,3] Agricultural Engineering 36[1] Animal Husbandry 26[1] Animal Husbandry 29[5] Drawing 27[3] Horticulture 27[3,5] Botany 26 Chemistry 26 Entomology 28 Mathematics 27 Physics 27 Physiology 33[2] French 3, 27, 30[5] German 3, 27, 30[5] Agricultural Education 29[5] Home Economics 30[2] Home Economics 32[2]

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[1] Agriculture Group requirement.

[2] Home Economics Group requirement.

[3] Horticulture Group recommendation.

[4] Physical and Biological Science Group requirement.

[5] Social Science Group recommendation.

MAJORS: JUNIOR AND SENIOR YEARS.

[The following statement applies to the classes of 1929 and 1930.]

General Statement.

A major consists of 60 credit hours of correlated work, which is arranged by the student and his adviser.

Rules Governing Majors.

Rule 1. *Election.* — Each student, before the first term of his junior year, shall elect a major subject, which shall consist of 60 credit hours of correlated work.

Rule 2. *Minimum Credits.* — The minimum number of credits for graduation shall be 120 junior-senior credit hours in addition to the satisfactory completion of the required courses of the freshman year and of the required and elective groups of the sophomore year.

Rule 3. *Maximum Credits.* — The maximum number of credits for any term of the junior or senior year shall be 22; the minimum shall be 18.

Rule 4. *Humanities and Rural Social Science.* — A minimum of 18 credit hours in the Divisions of the Humanities and Rural Social Science will be required of all students during their junior and senior years, with the following restriction: a minimum of 5 credit hours will be required in each of the divisions.

Rule 5. *Advisers.* — The work of each junior and senior will be under the immediate supervision of an instructor designated as major adviser. Ordinarily, the major adviser will be the head of the department in which the student elects his major. The adviser has full authority to prescribe the student's work up to 60 hours. He will, however, so far as practicable, recognize the individual needs of the student. It is also expected that students will seek the counsel of the adviser with respect to the remaining courses required for graduation.

Rule 6. *Free Electives.* — Each student during his junior and senior years is required to take 60 hours in his major and also 18 hours in the Divisions of the Humanities and Rural Social Science, making a total of 78 hours (but see Rule 4). He is allowed free choice of courses to complete his required hours.

Rule 7. *Registration.* — No junior or senior shall register until his major course of study is approved by his adviser.

(1) Course cards for recording the election of majors will be issued from the Schedule Room five weeks before the close of each term.

(2) This card must be submitted by each student to his major adviser, who will lay out the course for the succeeding term and countersign the card.

(3) Each course card must be filled out, giving the name of the student, his major, his class and the name and address of parent or guardian. When the major courses have been entered on this card, and the hours of free elections added by the student, the card, accompanied by one hour plan, must be returned to the Schedule Room two weeks before the beginning of the final examination period.

Rule 8. *Change of Major.* — Applications for change of major may be made to the Dean in writing at any time; when approved by both major advisers concerned and by the Dean and the committee on scholarship, the change becomes operative at the beginning of the term following, provided that no change in the selection of a major may be made by any student after registration day of his senior year.

MAJOR GROUPS: JUNIOR AND SENIOR YEARS.

[The following statement applies to the class of 1931 and succeeding classes.]

General Statement.

The aim of the last two years is to give to each student as high a degree of proficiency in some one branch of learning as is possible without sacrificing the breadth of knowledge and training which should characterize a well-rounded college course. In order to insure this result, each student is required to complete, during his last two years of study, certain requirements for specialization within his major group and certain minimum requirements in other groups:

I. Agriculture: departments of Agricultural Engineering, Agronomy, Animal and Dairy Husbandry, Farm Management, Poultry Husbandry.
II. Home Economics: department of Home Economics.
III. Horticulture: departments of Floriculture, Forestry, Landscape Gardening, Horticultural Manufactures, Pomology, Vegetable Gardening.
IV. Physical and Biological Sciences: departments of Bacteriology and Physiology, Botany, Chemistry, Entomology, Mathematics and Civil Engineering, Physics, Veterinary Science, Zoölogy and Geology.
V. Social Sciences: departments of Agricultural Economics, Agricultural Education, Economics, History, and Sociology, Languages and Literatures.

For purposes of fulfilling the extra group requirements specified below, Groups I to III inclusive are regarded as a unit, since their work is comparable in field and character.

SPECIFIC REQUIREMENTS.

RULE 1. *Credits for Graduation.* — The minimum number of credits for graduation shall be 108 junior-senior credit hours, in addition to the satisfactory completion of the required courses of the freshman year and of the required and elective groups of the sophomore year.

RULE 2. *Credits Each Term.* — Except upon special permission from the Scholarship Committee, no student shall enroll for more than 21 nor less than 16 credits each term of his junior and senior years.

RULE 3. *Specialization.* — At the close of his sophomore year each student shall designate some department within his major group in which he desires to specialize, and shall complete, during his junior and senior years, not less than 27 and not more than 54 credits in junior-senior courses offered in that department. In special cases, with the approval of the student's major adviser and the Dean, this requirement may be satisfied by the selection of at least the minimum number of credits from two or more departments of closely related work.

RULE 4. *Requirements in Other Groups.* — Each student shall complete, during his junior and senior years, not less than 9 credits in each of two groups other than his major group unit. That is, students pursuing a major in any one of Groups I to III, inclusive, must complete at least 9 credits each in Groups IV and V; students in Group IV must complete at least 9 credits each in Groups I to III, inclusive, and V; those in Group V, at least 9 credits in Groups I to III, inclusive, and IV.

RULE 5. *Advisers.* — The work of each student will be under the general supervision of his major group advisory committee from the beginning of his sophomore year, and during his junior and senior years under the immediate supervision of a special adviser who shall be some member of that committee and shall represent the department in which the student is to specialize under the terms of Rule 3. The adviser has full authority to prescribe the student's work up to the maximum 72 credits required by Rules 3 and 4, and may advise the student with reference to his elections under Rule 6.

RULE 6. *Free Electives.* — Subject to the limitations imposed by Rules 2, 3, 4, and 5, each student may elect during his junior and senior years any courses offered in the catalogue for which he has the necessary prerequisite training.

RULE 7. *Registration.* — No junior or senior shall register until his course of study is approved by his adviser.

(1) A card for recording the election of courses will be issued from the Schedule Room five weeks before the close of each term.

(2) This card must be submitted by each student to his adviser, who will lay out the course for the succeeding term and countersign the card.

(3) This card accompanied by one hour plan must be returned to the Schedule Room two weeks before the beginning of the final examination period.

RULE 8. *Changing of Major Group.* — Application for change of major group can be made to the Dean in writing at any time; when approved by both major group advisory committees concerned and by the Dean and the Scholarship Committee, the change becomes operative at the beginning of the term following, provided that no change in the selection of a major group may be made by any student after registration day of his senior year.

Description of Courses

[Heavy-faced Roman numerals indicate the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

DIVISION OF AGRICULTURE.

Agriculture.

REQUIRED COURSES.

1. **I.** 2. **II.** 3. **III.** AGRICULTURE. — Required course for all freshmen. A survey course, tracing the development of man as influenced by agriculture. It considers those problems which our complicated present-day civilization looks to agriculture to solve — problems practical, scientific, commercial, sociological. The object of the course is to give to students the agricultural concept and an appreciation of the close relationship of all lines of human activity to the great problems of agriculture.

2 class hours. Credit, 2.

Assistant Professor LANPHEAR.

6. **III.** VOCATIONAL OPPORTUNITIES FOR WOMEN. — For freshman women. An outline of the occupational progress of women, with special attention to the opportunities for women in those vocations for which the Massachusetts Agricultural College gives foundation preparation.

2 class hours. Credit, 2.

Miss HAMLIN.

Agricultural Engineering.

Professor GUNNESS, Assistant Professor MARKUSON, Mr. PUSHEE, Mr. NEWLON.

The courses in agricultural engineering are planned to give a working knowledge of those phases of engineering which apply directly to the farm. It is expected that the student will acquire a clear understanding of modern farm practice as it relates to permanent improvements of the farm and the farmstead, and in the selection and use of farm equipment.

ELECTIVE COURSES.

34. **I.** POWER ENGINEERING. — For sophomores; juniors and seniors may elect. This course deals with the application of power on the farm and in the home. A study is made of the various sources of power and methods of power transmission, including electric power. Through the solution of problems the student gets a thorough training in that branch of mechanics which deals with power and hydraulics. A study of the principles of hydraulics as they affect water supply; power from streams; pumps for domestic, dairy, and irrigation purposes.

2 class hours. 1 2-hour laboratory period, credit, 3.

Professor GUNNESS.

35. **II.** HEAT ENGINEERING. — For sophomores; juniors and seniors may elect. The purpose of this course is to acquaint the student with the principles involved in heating, refrigeration, and heat engines. A study is made of the various types of house heating systems; the application of heat, as in cooking and pasteurization; refrigeration as applied to dairy, cold storage, and house-

hold use; and the application of electricity to cooking and lighting. The course is taught chiefly by means of problems which call for a working knowledge of the principles involved.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Gunness.

36. **III.** Mechanical Drawing and Building Construction. — For sophomores; juniors and seniors may elect. The exercises include lettering, geometric construction, orthographic projection, isometric drawing, and the making of working drawings of simple farm equipment. This course is for the agricultural student who wishes to learn the use of drawing instruments, the reading of blue prints, and some of the general practices of drafting valuable to every agriculturist. Instruction is given in building construction in order to teach the use of carpentry tools, to teach the economical use of building materials, and to give the elements involved in the framing of small structures. Students who contemplate taking Agricultural Engineering 75 will find this course helpful.
3 2-hour laboratory periods, credit, 3.
Laboratory fee, $1.00. Assistant Professor Markuson and Mr. Pushee.

50. **II.** Farm Equipment. — For juniors; others may elect. This course deals with the mechanical equipment of the farm including care and and repair of field implements. Practice is given in forge work, pipe fitting, soldering, and the use of machine tools. The purpose of this course is to acquaint the student with the place of up-to-date equipment on the farm and to give an appreciation of the factors involved in obtaining efficient use of this equipment.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Laboratory fee, $1.00. Professor Gunness and Mr. Newlon.

53. **II.** House Planning and Construction. — For juniors; seniors may elect. Plan designs of the small house will be made. The arrangement of interior equipment, especially in the kitchen; lighting; heating; water supply; and sewage disposal will be studied, together with a brief history of the house, materials, construction methods, equipment, and architectural styles. Consideration will be given to the economics of house building, including financing, and to maintenance and overhead expense.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Laboratory fee, $1.00. Assistant Professor Markuson.

75, **I.** Farm Structures. — For seniors; juniors may elect. A study of the strength and durability of concrete, wood, stone, and clay products, and of the mechanical principles underlying their use in farm construction. The design of various farm buildings, such as the general purpose barn, dairy stable, hog house, sheep barn, milk house, etc. In the drafting room, details of construction will be worked out, a study of the mechanics of simple roof trusses will be made, and a complete design of some major farm building will be finished in all essential details. Blueprints of the finished design will be made.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Laboratory fee, $1.00. Assistant Professor Markuson.

78. **II** and **III.** Farm Motors. — For seniors; juniors may elect. This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. The theory of the internal combustion engine is taken up in order to emphasize the effect of design and operation on power and economy. The various types of carburetors, ignition, and lubrication systems are studied in detail. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles and tractors. Special attention is given to overhauling and repairing.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Laboratory fee, $1.00. Professor Gunness and Mr. Pushee.

79. **III.** Drainage and Irrigation Engineering. — For seniors; juniors may elect. The course covers the engineering phase of drainage and irrigation.

The various systems are studied, and practice is given in the design of drainage and irrigation systems. Field work gives practice in surveying for drains, platting, locating drains, erecting batterboards, and laying tile. Practice is given in assembling equipment for spray irrigation, and the flow of water through nozzles is studied by means of laboratory tests.
2 class hours. 2 3-hour laboratory periods, credit, 5.
Assistant Professor MARKUSON.

81, **III.** DAIRY MECHANICS. — For juniors; seniors may elect. A study of dairy machinery, including steam boilers, engines, pumps, traps, refrigeration machinery, and heat-controlling devices. Practice is given in pipe fitting, packing valves, lacing belts, and similar repair jobs on the equipment used in dairy plants. Not given 1928–29.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor GUNNESS and Mr. NEWLON.

Agronomy.

Professor BEAUMONT, Assistant Professor CUBBON, Mr. THAYER.

The courses in agronomy are designed to give instruction concerning the basic knowledge of the soil and its management, fertilizers and their use, and the principal products of the field. An important objective of our undergraduate teaching is to give supporting training to groups specializing in other departments. For undergraduates desiring to specialize in agronomy adequate courses are offered, but for those expecting to go into advanced educational or research work our graduate training is recommended as preferable.

Elective Courses.

25. **I.** FIELD CROPS. — For sophomores; juniors and seniors may elect. The course deals with the most important field crops of the world, but emphasizes those of special importance in New England.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.25. Assistant Professor CUBBON.

27. **III.** SOIL MANAGEMENT. — For sophomores; juniors and seniors may elect. An introductory course covering the properties and management of soils.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.25. Assistant Professor CUBBON.

50. **II.** CROP PRODUCTION FOR DAIRY AND STOCK FARMS. — For juniors; seniors may elect. An intensive study of methods and problems of production of those field crops of greatest importance in the successful management of New England dairy and stock farms. Special attention will be given to the conditions found on the Massachusetts general farm on which dairying and stock-raising are important.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.50. Assistant Professor CUBBON.
Prerequisite, Agronomy 27.

51 **III.** ADVANCED FIELD CROPS (1928–1929). — For juniors and seniors. This course is designed primarily for those specializing in field crops. Studies begun in Course 50 will be continued and extended to crops of importance beyond the range of New England. Theory and practice of crop improvement by plant breeding will be given attention. Given in alternate years.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.50. Assistant Professor CUBBON.
Prerequisite, Agronomy 50.

75. **I.** ADVANCED SOILS (1929–30). — For juniors and seniors. A continuation of studies begun in Agronomy 27, with special emphasis on soil classification and land utilization. Problems arising in the management of extreme soil types,

and specific problems of moisture control and tillage will be given special consideration. Given in alternate years.
2 class hours. 1 4-hour and 1 2-hour laboratory period, credit, 5.
Laboratory fee, $2.25. Assistant Professor CUBBON.
Prerequisite, Agronomy 27.

77. **II.** MANURES, FERTILIZERS, AND SOIL AMENDMENTS. — For juniors and seniors. An advanced course in which are studied manures, fertilizers, and other materials applied to the soil for crop nutrition; experimental work bearing on soil fertility and plant nutrition; and theory and practice concerning the use of manures, fertilizers, and lime.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Laboratory fee, $2.50. Professor BEAUMONT.
Prerequisite, Agronomy 27; advised, Chemistry 61.

Animal and Dairy Husbandry.

Professor FRANDSEN, Assistant Professor RICE, Assistant Professor GLATFELTER, Assistant Professor MACK, Mr. LINDQUIST, Mr. PARSONS.*

ANIMAL HUSBANDRY.

The courses in animal husbandry are offered to meet the needs of students interested in the various phases of live-stock farming and market-milk production; agricultural college teaching; high and secondary school teaching; federal, state, railroad, bank, or breed extension services; federal or state experiment station service; meat-packing industry; commercial feed industry.

Elective Courses.

25. **II.** DAIRY BREEDS. — For sophomores; juniors and seniors may elect. This course includes a survey of the dairy industry. The origin, history, development, and characteristics of the dairy breeds, and their adaptability to New England conditions are studied. Preliminary work in scoring animals according to the recognized standards is given, followed by comparative judging and placing.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $1.50. Professor FRANDSEN and Mr. PARSONS.

26. **III.** HORSES, SWINE, SHEEP, AND BEEF CATTLE. — For sophomores; juniors and seniors may elect. In this course consideration is given to the origin, history, development, and characteristics of the breeds of horses, swine, sheep, and beef cattle. Types, market classes, and grades of live stock are studied, together with their economic importance to the country in general, and Massachusetts in particular. Preliminary work is given in scoring each type of animal, followed by judging and placing of groups.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $1.50. Assistant Professor GLATFELTER.

29. **III.** SURVEY AND JUDGING OF LIVE STOCK. — For sophomores; juniors and seniors may elect. This course includes a survey of the live stock industry. The origin, history, development, characteristics, distribution, and adaptability of each important breed of dairy cattle, beef cattle, sheep, swine, and horses are studied. Preliminary work in the scoring of pure-bred animals according to recognized standards is given, which is followed by considerable practice in judging and placing classes of live stock. This course is especially arranged for students enrolled in the Division of Rural Social Science and for others feeling a need for a general animal husbandry course.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor GLATFELTER.

50. **I.** THE NUTRITION OF FARM ANIMALS. — For juniors; seniors may elect. This course consists of a study and application of the principles of physiological

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* Mr. Parsons' appointment is temporary.

chemistry to the practical problems of animal feeding and growth. Consideration will be given to the chemical composition of plant and animal life; physiology of digestion; functions of vitamines, minerals, protein, and energy; feeding standards and their application; the composition of farm crops, their by-products, and commercially mixed feeds, and their utilization for the economical production of live stock and their products.
3 class hours. Credit, 3.
Assistant Professor RICE.
Prerequisites, Animal Husbandry 25 and 26.

52. **III.** ADVANCED LIVE-STOCK JUDGING. — For juniors; seniors may elect. This course serves as a laboratory supplement to Animal Husbandry 53. It has three aims: (*a*) to train the student to see and evaluate differences in farm animals; (*b*) to begin the training of men who will act as judges of live stock at fairs; (*c*) to develop judging teams in both fat stock and dairy cattle to represent the college in the intercollegiate live-stock judging contest at the leading expositions. Trips will be taken each Saturday during the term to the leading herds and flocks in Massachusetts and nearby states. Approximate expense of travel is twenty-five dollars.
1 2-hour laboratory period on Friday, and all day Saturday, credit, 3.
Assistant Professor RICE.
Prerequisites, Animal Husbandry 25 and 26.

53. **III.** THE BREEDING AND IMPROVEMENT OF FARM ANIMALS. — For juniors; seniors may elect. This course is planned to give a broad view of the rise of many types and breeds from one ancestral stock; to note the origin, value, and permanence of certain variations; and to make clear the reasons for certain excellencies. The course also deals with the physiology of reproduction and with genetics, as a foundation for experience in actual production.
3 class hours. Credit, 3.
Assistant Professor RICE.
Prerequisites, Animal Husbandry 25 and 26; Zoölogy 26.

54. **II.** MEAT AND MEAT PRODUCTS. — For juniors; seniors may elect. This course deals with the manufacture of animals into their various commercial products and the distribution of these products to the consumer. Practice is given in the slaughtering of beef cattle, hogs, and sheep; judging of carcasses; cutting and curing of meats. The practical work is augmented by studies in the grading of fat stock, in packing house methods, in the magnitude and trends of the meat industry, and in the opportunities of local New England marketing.
1 class hour. 1 4-hour laboratory period, credit, 3.
Assistant Professor RICE and Mr. PARSONS.

75. **I.** DAIRY CATTLE AND MILK PRODUCTION. — For seniors. Consideration is given to the application of the principles of animal nutrition to the particular problems of dairy cattle feeding. Methods of feeding for high milk production are studied. Cost of milk production, and breeding and management problems are carefully considered. A survey is made of recent experiment station results.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $1.50. Assistant Professor RICE and Mr. PARSONS.
Prerequisites, Animal Husbandry 25, 50, 52, and 53.

76. **II.** BEEF AND SHEEP PRODUCTION. — For seniors. Application of the principles of nutrition is made to the feeding of beef cattle and sheep. Feeding, breeding, and management problems are considered. A survey is made of recent experiment station work, and special study is given to the opportunities for the Massachusetts farmer to produce high-quality beef and lamb.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor GLATFELTER.
Prerequisites, Animal Husbandry 26, 50, 52, and 53.

77. **III.** Horses and Swine Production.— For seniors. This course is planned to familiarize students with the application of the principles of nutrition to the feeding of horses and swine. Physiological and economic factors are considered in selecting suitable feeds. Cost of production, and breeding and managerial problems in commercial horse and pork production are considered. A study is also made of recent experiment station results in feeding, breeding, and management.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor Rice.
Prerequisites, Animal Husbandry 26, 50, 52, and 53.

80. **III.** Dairy Herd Management. — For seniors. The course includes a study of systems of dairy herd management; record form; methods of cost accounting; fitting for production, show and sale; cow testing and bull association work.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Frandsen and Assistant Professor Rice.

81. **II.** Animal Husbandry Seminar. — Required of students majoring in animal husbandry. Students will prepare original papers and talks on various pertinent topics. Round table discussions of animal husbandry investigational work and practices will be conducted. Frequent addresses will be made to the class by prominent breeders and scientists.
1 class hour. Credit, 1.
Assistant Professor Rice.

DAIRY MANUFACTURES.

The courses in dairy manufactures are offered to meet the needs of students interested in the handling of market milk, and the science and art of butter making, ice-cream making, and cheese making; agricultural college teaching, and experiment station work; high and secondary school teaching; extension work; research and investigational work.

Elective Courses.

50. **I.** General Dairying. — For juniors; seniors may elect. A general course, prerequisite to all other dairying courses except 51 and 53, and for those who wish to take only one course in dairying to get a general knowledge of the subject. The work covers briefly: a study of milk, its secretion, composition, and various tests applied thereto; methods of handling milk and cream; the use of separators; elements of butter making, cheese making, and ice-cream making.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Laboratory fee, $3.00. Professor Frandsen and Mr. Lindquist.

51. **II.** Judging Dairy Products. — For juniors; seniors may elect. A study of standards and grades of dairy products, with practice in judging milk and ice cream, as well as butter and cheese. The student learns to recognize quality in dairy products, to detect specific defects, and to know their causes and the means of their prevention.
Laboratory fee, $3.00. 1 2-hour laboratory period, credit, 1.
Assistant Professor Mack.

52. **III.** Market Milk. — For juniors; seniors may elect. A study of the various phases of the market milk industry: sanitary production, transportation, marketing, handling in the city plant, delivery systems, milk and its relation to the public health, inspection, milk laws, food value, and advertising. Some milk plants will be visited. The approximate expense of travel is five dollars.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Laboratory fee, $3.00. Mr. Lindquist.
Prerequisite, Dairy 50.

53. **III.** Advanced Judging of Dairy Products. — For juniors; seniors may elect. The judging of milk, ice cream, butter, and cheese, using standard commercial methods and official score cards. A team is chosen from this class to represent the college in dairy products judging contests at the Eastern States Exposition and the National Dairy Show.
2 2-hour laboratory periods, credit, 2.
Assistant Professor Mack.
Prerequisite, Dairy 51.

75. **I.** Milk Products (1929–30). — For juniors and seniors. The manufacture of milk products other than butter and ice cream, including cheddar cheese, soft and fancy cheese, condensed and powdered milk, casein, commercial buttermilk, etc. Laboratory exercise largely in cheese making and commercial buttermilk manufacture. Given in alternate years.
1 class hour. 1 4-hour laboratory period, credit, 3.
Laboratory fee, $3.00. Mr. Lindquist.
Prerequisite, Dairy 50, previously or in conjunction.

76. **I.** Advanced Testing (1928–29). — For juniors and seniors. The work covers moisture and fat testing for all dairy products; the casein test; salt test for butter; acid tests; work with the Mojonnier apparatus; and many other applied chemical tests used in dairy manufactures work. Given in alternate years.
Laboratory fee, $3.00. 2 4-hour laboratory periods, credit, 4.
Assistant Professor Mack.
Prerequisite, Dairy 50, previously or in conjunction.

77. **II.** Butter Making (1928–29). — For juniors and seniors. A study of separators and cream separation; handling milk and cream for butter making; preparation of starters, and ripening cream; churning; markets and their requirements; marketing, scoring and judging butter; creamery management; care of butter-making equipment; problems. Given in alternate years.
2 class hours. 2 3-hour laboratory periods, credit, 5.
Laboratory fee, $3.00. The Department.
Prerequisite, Dairying 50.

78. **III.** Ice-Cream Making (1929–30). — For juniors and seniors. A study of the principles and practice of ice-cream making. The laboratory instruction will cover commercial practices. Some ice-cream plants will be visited. The approximate expense of travel is five dollars. Given in alternate years.
2 class hours. 2 3-hour laboratory periods, credit, 5.
Laboratory fee, $3.00. Assistant Professor Mack.
Prerequisite, Dairying 50.

79. **I.** 80. **III.** Seminar. — For students majoring in dairy manufactures. This course consists of a study of the work accomplished by various experiment stations, also a review of foreign literature. Students will prepare papers on various dairy subjects. Frequent addresses will be made to the class by visiting dairy authorities.
1 class hour. Credit, 1.
Professor Frandsen.

Farm Management.

Professor Foord, Assistant Professor Barrett.

The purpose of the courses in this department is to train men to manage farms and other agricultural enterprises, as well as to prepare them for research and teaching in similar lines.

75. **I.** Farm Organization. — For seniors. A general course in the organization and business management of the farm. A study of regions and types of farming; the farmer as a business proprietor; funds for investment in the farm business; use of labor, land, equipment, and materials; selection and combina-

tion of factors of farm production. Discussions of the size of the farm business, farm balance, farm layout and arrangement.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor Barrett.
Prerequisites, Agronomy 50; Animal Husbandry 25 and 26; some farm experience.

76. **II.** Farm Operation and Cost Accounting. — For seniors. A continuation of Course 75. A study of the means of production, and the selection and combination of farm enterprises. Discussions of the nature of farming costs, the farmer's profits, and the farmer as a technical expert. The consideration of farm records and accounts as a basis for efficient operation.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor Barrett.
Prerequisite, Farm Management 75.

77. **III.** Advanced Farm Organization. — For seniors. A further and more specific study of the principles and practices outlined in Courses 75 and 76, with special reference to their application to farms in Massachusetts. Field trips are required at an approximate expense of five dollars.
1 class hour. 1 4-hour laboratory period, credit, 3.
Assistant Professor Barrett.
Prerequisites, Farm Management 75 and 76.

78. **II.** 79. **III.** Seminar. — For seniors majoring in general agriculture; others by arrangement.
1 class hour. Credit, 1.
Professors Foord and Barrett.

81. **III.** Farming in the United States. — For seniors. A study of the agricultural regions of the United States and the different types and methods of farming carried on in each. The economic reasons for the establishment and maintenance of each type will be considered.
2 2-hour laboratory periods, credit, 2.
The Department.
Prerequisite, Farm Management 76.

Poultry Husbandry.

Professor Graham, Professor Sanctuary, Assistant Professor Banta, Miss Pulley.

The department aims to give instruction in the science, art, and practices of poultry keeping not only to the men majoring in this department, but also to students majoring in other departments and desiring supporting courses in poultry husbandry. Our major courses prepare men for the successful operation of commercial poultry farms and marketing projects either as owners or managers; for graduate work, teaching, extension and investigational work.

Elective Courses.

50. **I.** Poultry Judging. — For juniors; seniors may elect. A study of the origin and evolution of our standard breeds and varieties of domestic fowl; judging production quality, using trapnested birds; judging exhibition quality by score card and comparison. One or more poultry farms, an egg-laying contest, and a poultry show will be visited. Poultry judging teams competing in the inter-collegiate contest at Madison Square Garden each January are trained in this course.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Assistant Professor Banta.

51. **II.** Poultry Feeds and Feeding. — For juniors; seniors may elect. A study of the common feeds and the scientific principles underlying the field of nutrition. Recent experimental work and current feeding problems will receive

special consideration. For observational practice and accumulation of original data, the management of a pen of birds will be required for a period of a few weeks.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Laboratory fee, $2.50. Assistant Professor BANTA.

52. **III.** INCUBATION AND BROODING. — For juniors; seniors may elect. A study of the fundamental principles underlying incubation and brooding practices. The science of physics and general biology is applied to the study of incubation and brooding processes. Students become thoroughly acquainted with modern incubation and brooding equipment through detailed study and operation of typical incubators and brooders. Present-day problems are considered and some are investigated as a part of the class work.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Laboratory fee, $3.00. Professor SANCTUARY and Miss PULLEY.

75. **I.** POULTRY HOUSING AND SANITATION. — For seniors. A consideration of the biological needs of poultry from the standpoint of housing, and the economic principles governing designing and construction of poultry houses and equipment for poultry farm buildings. The course also embodies a study of the principles of poultry sanitation, including external parasites and the insecticidal agents for their control.
3 class hours. Credit, 3.
Professor SANCTUARY.

76. **I.** MARKET POULTRY AND POULTRY PRODUCTS. — For seniors. A study of market classes of poultry and eggs; preparation of poultry products for market; requirements of different markets; methods of marketing, involving a study of distribution, finances, and business organizations; cold storage and transportation; advertising, prices, and food values. Laboratory exercises in candling, packing, killing, dressing, and similar operations to make the above named factors more concrete. Students are required to fatten pens of chickens by different methods and rations, keeping accurate data of the gains in weight and quality, also the costs of feed and labor, and resultant profit or loss. Competitive judging of the exhibits in the Annual Market Poultry Show, staged by the members of this class, is a feature of the course. When possible, a short trip to Springfield is arranged to study cold storage plants and the handling of poultry products in the local market.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Miss PULLEY.

77. **II.** POULTRY BREEDING. — For seniors. Methods of selection and improvement of poultry are developed through the study of the principles of heredity. Most of the course centers around the progeny test and pedigree method of breeding. Students taking this course participate in the college plant selection in pedigree work. Three breeds of poultry, each pedigreed for from seven to twenty years, furnish practice materials.
4 class hours. 1 2-hour laboratory period, credit, 5.
Laboratory fee, $2.00. Professor SANCTUARY.

78. **III.** FARM POULTRY. — For seniors; juniors may elect. For those students who desire a general knowledge of poultry husbandry but who cannot devote more than one term to the subject; it is not intended for students specializing in poultry, and such students are admitted only by special permission. Emphasis is placed on the farm flock and its economic management. Utility classification, housing, culling, feeding, hatching, rearing, production, marketing, and disease control receive special consideration.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Assistant Professor BANTA.

79. **III.** POULTRY FARM ORGANIZATION. — For seniors. This course embodies the application of economic and business principles to poultry farming.

The place and importance of the various branches of well-organized poultry farms and their relation to each other receive special consideration; also the study of surveys and production costs. A trip covering two or three days will be made to representative successful poultry farms. The expense per student is approximately fifteen dollars. This trip is required of each student taking the course for credit.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor GRAHAM.

Prerequisite, Poultry 77.

80. **I, II, and III.** POULTRY PROBLEMS. — Open to seniors only. This course consists of individual problems chosen by the students under guidance of the department. The work is of an advanced nature, supplementing that of the regular poultry curriculum. Copy of project outline, indicating the number of credits, must be filed with the department and with the Dean at the opening of the term.
Credit, 1 to 4.
The DEPARTMENT.

DIVISION OF HOME ECONOMICS.

Professor SKINNER.

Home Economics.

Professor SKINNER, Assistant Professor KNOWLTON, Assistant Professor TUCKER.

The home economics courses offered are planned to meet the needs of (1) those students who are interested in education for homemaking as an integral part of the general education of women; (2) those who wish to enter a graduate school leading to professional work; (3) those who are interested in preparing for home economics extension service, both junior and adult; (4) those who are interested in professional or vocational work in which an understanding of home economics is fundamental, such as family or community welfare work, etc.; (5) those who wish to teach home economics, in which case certain elective courses should be chosen in the Department of Agricultural Education to secure a Massachusetts teacher's certificate. Other departments offer courses planned especially for students in home economics, as follows: Mechanics of the Household, House Planning and Construction, in the Department of Agricultural Engineering; General Design in the Department of Landscape Gardening; and Food Preservation in the Department of Horticultural Manufactures.

Required Course.

1. **I.** INTRODUCTION TO HOME ECONOMICS. — For freshman women. Lectures on the history and evolution of the home; social customs and their value in family relationships; healthful and suitable care of the wardrobe; principles of nutrition as applied to the student's life; the student's budget, and the keeping of personal accounts.
2 class hours. Credit, 2.
Miss SKINNER.

Elective Courses.

25. **I.** CLOTHING APPRECIATION AND DESIGN. — For sophomores; juniors and seniors may elect. Line, design, and color in relation to the college student's wardrobe will be studied. The care of clothing will also be included.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $1.00. Miss TUCKER.

28. **I.** CLOTHING SELECTION AND CONSTRUCTION. — For sophomores; juniors and seniors may elect. This course includes a study of the selection and purchase of suitable materials, of the use of commercial patterns, and of practical methods of making simple garments. The estimated cost of materials used is from five to ten dollars.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Laboratory fee, $1.50. Miss TUCKER.

30. **III.** Foods. — For sophomores; juniors and seniors may elect. A study of foods in their scientific and economic aspects, with the preparation of simple breakfasts and luncheons.
1 class hour. 2 3-hour laboratory periods, credit, 3.
Laboratory fee, $3.00. Miss Knowlton.

32. **III.** Applied Design. — For sophomores; juniors and seniors may elect. Applications of the principles of design are worked out in specific problems using various media. Much opportunity is allowed for individual expression. The estimated cost of materials used is five dollars.
3 2-hour laboratory periods, credit, 3.
Miss Tucker.
Prerequisite, Landscape Gardening 30.

50. **I.** Foods. — For juniors; seniors may elect. A further study of foods on the basis of meal planning in the home, with especial emphasis on dinners and the day's meals as a whole.
2 class hours. 2 3-hour laboratory periods, credit, 5.
Laboratory fee, $4.00. Miss Knowlton.
Prerequisite, Home Economics 30, or permission of instructor.

51. **II.** Nutrition. — For juniors; seniors may elect. A study of the food requirement throughout infancy, childhood, adolescence, adult life, and old age, considering the energy value of foods and the nutritive properties of foodstuffs. Typical dietaries are planned for each period, with special regard to economic and social conditions.
2 class hours. 2 3-hour laboratory periods, credit, 5.
Laboratory fee, $2.00. Miss Knowlton.
Prerequisites, Home Economics 30 and 50; Chemistry 30.

56. **II.** Clothing and Textiles. — For juniors; seniors may elect. A study of the production, manufacture, identification, and use of the common textile fibers. Class trips to textile mills will be included, at an estimated expense of two dollars. Laboratory work in the construction of garments is used as a basis for a study of ready-made garments. The estimated cost of materials used is from five to ten dollars.
2 class hours. 2 3-hour laboratory periods, credit, 5.
Laboratory fee, $1.50. Miss Tucker.
Prerequisites, Home Economics 25, 32; Landscape Gardening 30; Home Economics 28 is also prerequisite for those majoring in home economics.

58. **III.** General Course in Foods and Nutrition. — For juniors and seniors, not home economics majors, both men and women. A survey of the principles of food preparation, meal planning, and food values with emphasis on the relation of good nutrition to health.
2 class hours. 2 3-hour laboratory periods, credit, 4.
Laboratory fee, $4.00. Miss Knowlton.

61. **III.** Home Furnishing. — For juniors; seniors may elect. A study of the fundamental principles which underlie the successful planning and furnishing of a satisfying home. Many applications of these principles are worked out in practical problems.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Laboratory fee, $1.50. Miss Tucker.
Prerequisite, Landscape Gardening 30; Agricultural Engineering 53.

76. **I.** Home Management. — For seniors. The application of the principles of scientific management to the household, and the elements of successful home making. The family income, cost of living, household accounts, the budget

and its apportionment. The responsibility of the woman to her family and the community in establishing right standards of living.
4 class hours. 1 2-hour laboratory period, credit, 5.
Miss Skinner.

78. **III.** Health, and Home Care of the Sick. — For seniors. A study of the care of the family health; simple diseases and their prevention; the care of young children and invalids; first aid to the injured.
3 class hours. Credit, 3.
Miss Skinner.

81. **I.** The Community of the Home Economics Graduate. — For seniors. This course is intended to be a practical application of home economics to the various social, economic, industrial, and educational problems relating to the home, which the home economics graduate may meet in any community, either as an employed worker or as a volunteer. This may include a field trip to Boston and other centers at an estimated cost of ten dollars. Recommended only to those pursuing a major in home economics.
2 class hours. 1 2-hour laboratory period, credit, 3.
The Department.

82. **II.** Problems in Elementary Nutrition. — For seniors. This course is intended to show how the home economics graduate fits into the health program of the school, either as a teacher or as a volunteer worker. Recommended only to those pursuing a major in home economics.
2 class hours. 1 2-hour laboratory period, credit, 3.
The Department.

83. **III.** Field Problems under Supervision. — For seniors. This course is intended to be a more intensive application of home economics to special community problems and to serve as a beginning of simple research work. Recommended only to those pursuing a major in home economics. Required trips, at an estimated cost of five dollars.
2 class hours. 1 2-hour laboratory period, credit, 3.
The Department.

85. **II.** Clothing Economics. — For seniors. This course includes a study of clothing budgets for college students and business women, and a critical analysis of sources of clothing information. Some special investigation is carried on by each student. Advanced work in garment construction is continued. The estimated cost of materials used is from seven to twelve dollars.
2 class hours, 2 3-hour laboratory periods, credit, 5.
Laboratory fee, $1.50. Miss Tucker.
Prerequisite, Home Economics 56.

DIVISION OF HORTICULTURE.

Professor Waugh.

Floriculture.

Professor Thayer, Assistant Professor Hubbard.

The courses in floriculture are intended to present a general knowledge of all phases of greenhouse design, construction, heating, and management, the culture of florists' crops (under glass and outdoors), floral decoration and arrangement, and the marketing of plants and flowers. The department aims to train students so that they may take up various phases of commercial floriculture, positions in nursery establishments, and the management of conservatories on private estates, in parks and cemeteries.

Elective Courses.

50. **I.** Greenhouse Management. — For juniors; seniors may elect. Designed to familiarize students with the methods followed in the management of

greenhouses and greenhouse crops, and the principles underlying the same; history and development of the floricultural industry; preparation of soils; fertilizers; potting; watering; ventilation; control of insects and diseases; methods of plant propagation; forcing of plants. At some time during the term the members of the class will be required to take a one-day trip to visit large commercial establishments. The approximate expense of the trip is five dollars. Lectures, assigned readings, reports, and laboratory practice.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Laboratory fee, $1.50. Professor THAYER.
Prerequisite, Horticulture 25, 26, and 27.

51. **II.** GREENHOUSE MANAGEMENT. — For juniors; seniors may elect. Continuation of Course 50. Several field trips, to study floricultural establishments in the vicinity, will be made during the laboratory periods. The approximate expense of the trips is three dollars.
2 class hours. 1 4-hour laboratory period, credit, 4.
Laboratory fee, $1.50. Professor THAYER.
Prerequisite, Floriculture 50.

52. **III.** FLORAL ARRANGEMENT. — For juniors; seniors may elect. A study of the principles underlying the arrangement and use of cut flowers and plants; funeral designs, basket and vase arrangement, table decorations, home, church, and all interior decorations; a study of color as applied to such work. Lectures, assigned readings, and reports. This course is limited to ten students.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Laboratory fee, $5.00. Professor THAYER.

53. **I.** GREENHOUSE CONSTRUCTION AND HEATING. — For juniors; seniors may elect. The location, types, arrangement, construction, cost, equipment, heating and ventilating of greenhouse structures; the drawing of plans and study of specifications for commercial houses and conservatory ranges. Such practical work as glazing and the construction of concrete benches and cold frames is included as facilities allow. Lectures, assigned readings, and problems.
3 class hours. 1 2-hour laboratory period, credit, 4.
Laboratory fee, $1.00. Professor THAYER.

55. **III.** GARDEN FLOWERS AND BEDDING PLANTS. — For juniors and seniors. A study of the annuals, biennials, herbaceous perennials, bulbs, bedding plants, and roses that are valuable for use in floricultural or landscape gardening work. Methods of propagation, culture and uses of the various plants are considered; identification of material. Lectures, assigned readings, and reports.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $1.50. Professors THAYER and HUBBARD.

75. **I.** 76. **II.** COMMERCIAL FLORICULTURE. — For seniors. A detailed study of the cultural methods for the important commercial cut-flower crops and potted plants. Visits will be made to commercial establishments during the courses. The lectures are supplemented with textbooks and assigned readings.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00 per term. Assistant Professor HUBBARD.
Prerequisite, Floriculture 51.

77. **III.** COMMERCIAL FLORICULTURE. — For seniors. The marketing of flowers and plants, including the management of wholesale markets and retail flower stores; a study of systems of record keeping, cost analysis, inventory methods, and other phases of this important part of the floricultural industry.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor HUBBARD.
Prerequisite, Floriculture 76.

79. **II.** CONSERVATORY PLANTS. — For seniors. A study of the foliage and flowering plants used in conservatory work; methods of propagation, culture,

use and arrangement; identification of plants. Lectures, assigned readings, and reports.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Professor Thayer.

80. **III.** Seminar. — For seniors majoring in floriculture. Advanced study of subjects pertaining to some phase of floriculture. All students are assigned specific problems and pursue study in these problems by reading and research. The results of this study must be presented in the form of a thesis. Seminars are conducted weekly.
1 class hour 2 to 4 laboratory hours, not to exceed 3 credits.
Professor Thayer.

Forestry.

Professor Grose.

The forestry courses are intended primarily for prospective owners or managers of farm woodlots, and the field work is focused on typical New England problems. These courses are broad enough, however, to furnish valuable preparation for students planning to study forestry in graduate schools.

Elective Courses.

55. **I.** Woodlot Forestry: Estimating and Business Management. — For juniors and seniors. Topics: forest mapping; timber cruising; determining rate of growth and possible cut; financial returns; forest taxation; our national timber supply, present and future.
1 2-hour and 1 4-hour laboratory period, credit, 3.
Laboratory fee, $1.00. Professor Grose.

56. **II.** Woodlot Forestry: Logging, Milling, and Marketing. — For juniors and seniors. Topics: felling trees; sawing logs; hauling logs; the portable mill; the stationary mill; seasoning, measuring, and shipping lumber; lumber grades and prices; legal forms; by-products of the woodlot; adaptability of species to uses; wood-using industries of Massachusetts.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Grose.
Prerequisite, Forestry 55.

57. **III.** Woodlot Forestry: Timber-raising. — For juniors and seniors. Topics: forest planting; weeding; release cuttings; pruning; thinning; salvage cutting; protection from insects, fungi, fire, etc.; final cutting methods for natural reproduction of the forest.
1 2-hour and 1 4-hour laboratory period, credit, 3.
Laboratory fee, $1.00. Professor Grose.

58. **III.** Woodlot Forestry: Brief Survey. — For juniors and seniors. A condensation of Courses 55, 56, and 57 for those who have only one term to give to forestry.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $1.00. Professor Grose.

Horticultural Manufactures.

Professor Chenoweth, Mr. Cartwright.

The courses aim to give a knowledge of the practical problems connected with food preservation, with some skill in the manipulation of materials and equipment, together with a clear understanding of the scientific principles involved. Emphasis is placed upon the conservation of the cheaper grades of fruits and vegetables to the end that the entire crop may be marketed and that wholesome food may be produced from materials that would otherwise be lost. The social and economic values of this type of work and its relations to modern methods of living are emphasized.

Elective Courses.

75. I. Horticultural Manufactures. — For seniors and graduate students. A practical course in food preservation dealing primarily with fruits and vegetables. The canning of fruits and vegetables as practiced in the home and in commercial canneries. The manufacture of (*a*) fruit products, such as butters, jams, jellies, juices, marmalades, vinegars, etc., and (*b*) vegetable products, such as pickles, piccalilli, sauerkraut, etc. Particular attention is given to the study and use of all types of equipment suitable for the home or small factory, together with methods for testing and judging a large variety of manufactured products.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Professor Chenoweth.

76. II. Horticultural Manufactures. — For seniors and graduate students. A continuation of Course 75. Emphasis is placed on the preservation of small fruits. A comparison of relative values of different varieties of small fruits for canning and manufacturing purposes. Judging of canned and manufactured fruit and vegetable products, together with a study of commercial grades and standards of canned foods.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professor Chenoweth.
Prerequisite, Horticultural Manufactures 75.

77. III. Horticultural Manufactures. — For seniors and graduate students. A continuation of Courses 75 and 76, dealing primarily with maple products and the canning of meats and the early spring vegetables. Also a study of special problems involved in establishing and operating home and farm factories. Visits to near by farm factories and salting stations are required of all students.
2 2-hour laboratory periods, credit, 2.
Professor Chenoweth.
Prerequisites, Horticultural Manufactures 75 and 76.

78. III. Horticultural Manufactures. — For seniors and graduate students. Intended for the student who desires a broad, general knowledge of food preservation. A general course in food preservation, including lectures, readings, and laboratory exercises in the canning and drying of fruits and vegetables, and the manufacture of fruit and vegetable products. Emphasis is placed on the conservation of the low grades of fruits and vegetables in the home and the home factory.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Professor Chenoweth and Mr. Cartwright.

80. I. Horticultural Manufactures. — For junior and senior women. A course dealing with the problems of food preservation in the home. Application of present-day knowledge is made to the practices of canning, pickling, and manufacturing the autumn fruit and vegetable products.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Professor Chenoweth and Mr. Cartwright.

81. II. Horticultural Manufactures. — For junior and senior women. A continuation of Course 80. The preservation of small fruits and the home storage of fruits and vegetables. The use of salt in the home preservation of vegetables, the manufacture of pickles, and the canning of meats and poultry will constitute the main work in this course.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professor Chenoweth and Mr. Cartwright.
Prerequisite, Horticultural Manufactures 80.

Horticulture.

Professor WAUGH, Professor THOMPSON, Assistant Professor DRAIN, Mr. FRENCH.

The general subject of horticulture divides naturally into subjects of pomology, floriculture, forestry, landscape gardening, and vegetable gardening. A number of courses relate to more than one of these subjects, and are therefore grouped here under the general designation of horticulture.

Elective Courses.

25. **I.** RELATIONSHIPS AND ASSOCIATIONS OF HORTICULTURAL PLANTS. — For sophomores. A study of the outstanding characters utilized in acquiring a practical knowledge of the principal species and varieties of cultivated plants, together with a consideration of those principles which determine the natural associations of plants in so far as they bear on the best methods of plant culture.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professor THOMPSON.

26. **II.** HORTICULTURAL PRACTICES. — For sophomores. This course is designed to demonstrate and explain the principles underlying the practical cultivation of economic plants. Consideration will be given to the methods of propagation and to the culture of plants in their relation to soils, tillage, water, food supply, etc.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Assistant Professor DRAIN.

27. **III.** BREEDING OF HORTICULTURAL PLANTS. — For sophomores. A study of the principles of inheritance as applied to plants, together with a consideration of the methods used and problems involved in the improvement of horticultural crops.
3 class hours. Credit, 3.
Mr. FRENCH.

50. **I.** PLANT MATERIALS. — For juniors; seniors may elect. The course aims to make the student familiar with the distinguishing characters of trees, shrubs, and woody vines used in ornamental plantings, together with the propagation and care of the same.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Professor THOMPSON.

51. **III.** PLANT MATERIALS. — For juniors; seniors may elect. A continuation of Course 50, taking up the field uses of trees, shrubs, and woody climbers, their natural habitats, soils, and plant associations, with a view to supplying to the students in landscape gardening and floriculture a knowledge of the species and varieties used in ornamental planting. Frequent practicums and field excursions.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Professor THOMPSON.

Prerequisite, Horticulture 50.

75. **III.** HORTICULTURE REVIEW. — Required of all seniors majoring in the Division of Horticulture. Designed to correlate the various branches of plant science and horticultural practice.
1 lecture hour, 1 conference period. Credit, 2.
Professor WAUGH.

Landscape Gardening.

Professor WAUGH, Assistant Professor HARRISON, Assistant Professor COMBS.

The instruction in this department is aimed at two objectives: first, the contribution to general education; second, the preparation of men for the professional practice of landscape architecture. The former objective seems important from the fact that landscape gardening offers an excellent opportunity for the practical discussion of the principles underlying all the fine arts. In the professional courses students are prepared, as well as time permits, to begin work in landscape architecture which leads through field experience or post-graduate study to permanent establishment in that profession.

DRAWING.

Elective Courses.

25. **I.** FREE-HAND DRAWING. — For sophomores; juniors and seniors may elect. Lettering; free-hand perspective; sketching from type models, leaves, flowers, trees, houses, etc.; laying flat and graded washes in water colors; water-color rendering of leaves, flowers, and trees.

3 2-hour laboratory periods, credit, 3.
Laboratory fee, $3.00. Assistant Professor COMBS.

26. **II.** MECHANICAL DRAWING. — For sophomores; juniors and seniors may elect. Inking exercises; geometric problems; isometric projection; intersections; shades and shadows; parallel, angular, and oblique perspective; perspective drawing of buildings. Students should have preparation in plane and solid geometry.

3 2-hour laboratory periods, credit, 3.
Laboratory fee, $3.00. Assistant Professor COMBS.

27. **III.** TOPOGRAPHICAL DRAWING. — For sophomores; juniors and seniors may elect. Conventional signs and mapping in ink; conventional coloring and map rendering in water colors.

3 2-hour laboratory periods, credit, 3.
Laboratory fee, $3.00. Assistant Professor COMBS.
Prerequisite, Drawing 26.

30. **II.** ELEMENTARY DESIGN. — For sophomore women. Offered for the year 1927–28.
Laboratory fee, $2.50. 3 2-hour laboratory periods, credit, 3.
Assistant Professor COMBS.

LANDSCAPE GARDENING.

Elective Courses.

50. **I.** MAPPING AND TOPOGRAPHY. — For juniors. Reconnoissance surveys and mapping, with special reference to the methods used in landscape gardening. Must be followed by Course 51.

2 2-hour and 2 3-hour laboratory periods, credit, 5.
Laboratory fee, $2.50. Assistant Professor HARRISON.
Prerequisites, Mathematics 26 and 27, Drawing 25, 26, and 27.

51. **II.** ELEMENTS OF LANDSCAPE GARDENING. — For juniors. Detailed study of selected designs of leading landscape gardeners; grade design, road design, etc.

3 3-hour laboratory periods, credit, 4.
Laboratory fee, $2.50. Assistant Professor HARRISON.
Prerequisite, Landscape Gardening 50.

52. **III.** GENERAL DESIGN. — For juniors. Field notes; examination of completed works and those under construction; design of architectural details; written reports on individual problems.

2 2-hour and 2 3-hour laboratory periods, credit, 5.
Laboratory fee, $2.50. Assistant Professor HARRISON.
Prerequisites, Landscape Gardening 50 and 51, and either plant materials (Horticulture 50 and 51) or advanced mathematics.

75. **I.** Theory of Landscape Art. — For seniors and graduates. The general theory and applications of landscape study, including a brief history of the art.
3 class hours. Credit, 3.
Professor Waugh.

76. **I.** Civic Art. — For seniors. The principles and applications of modern civic art, including city planning, city improvement, village improvement, and rural improvement, with special emphasis upon country planning. Must be followed by Course 77.
3 3-hour laboratory periods, credit, 4.
Laboratory fee, $3.00. The Department.
Prerequisite, Landscape Gardening 52.

77. **III.** Country Planning. — For seniors. As stated under Course 76.
3 3-hour laboratory periods, credit, 4.
Laboratory fee, $3.00. Professor Waugh.
Prerequisite, Landscape Gardening 76.

78. **I.** Architecture (1928–29). — Alternates with Course 79. For juniors and seniors. The history of architectural development, the different historic types, with special reference to the underlying principles of construction and design and their relations to landscape design. Illustrated lectures, field trips, and study of details including preparation of plates.
3 class hours. Credit, 3.
Assistant Professor Harrison.

79. **I.** Construction and Maintenance (1929–30). — Alternates with Course 78. For juniors and seniors. Detailed instruction in methods of construction and planting, in carrying out plans, in organization, reporting, accounting, estimating, etc.; maintenance work in parks and on estates, its organization, management, cost, etc.
3 class hours. Credit, 3.
Assistant Professor Harrison.

80. **II.** Theory of Design. — For seniors. Lectures; exercises in pure design in two and three dimensions; conventional designs; modeling.
3 3-hour laboratory periods, credit, 4.
Laboratory fee, $3.00. Professor Waugh.
Prerequisite, Landscape Gardening 52.

81. **II.** Estate Design. — For seniors. Grading and planting plans; garden designs and planting.
3 3-hour laboratory periods, credit, 4.
Laboratory fee, $3.00. Assistant Professor Harrison.

82. **III.** Park Design. — For seniors.
3 3-hour laboratory periods, credit, 4.
Laboratory fee, $3.00. Assistant Professor Harrison.

Pomology.

Professor Sears, Professor Van Meter, Assistant Professor Drain, Mr. French, Mr. Roberts.

It is the object of the courses in pomology to give the student a thoroughly practical training, so that he may be able to perform or supervise all of the different operations in connection with the growing and marketing of the various fruits. At the same time he is given a thorough grounding in the scientific principles on which the practical work is based, in order that he may better understand the various practices taught.

Elective Courses.

53. **I.** General Pomology.— For juniors; seniors may elect. A study of the most approved practices in fruit production. Textbooks, lectures, and reference books; field and laboratory exercises.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Sears and Mr. Roberts.

54. **II.** Systematic Pomology. — For juniors; seniors may elect. A study of varieties of fruits, including identification, nomenclature, relationships and classification. This course is advised but not required of candidates for the varsity fruit judging team. Lectures, textbooks, laboratory and field exercises.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Laboratory fee, $4.00. Assistant Professor Drain.
Prerequisite, Horticulture 27.

55. **III.** Small Fruits. — For juniors; seniors may elect. A study of the growing of small fruits, including raspberries, blackberries, strawberries, currants, blueberries, and grapes, dealing with such questions as propagation, selecting a site for the plantation, soils, fertilizers, pruning, harvesting, marketing, etc.
2 class hours. 1 2-hour laboratory period, credit, 3.
Mr. French.

Prerequisite, Horticulture 27.

56. **III.** Spraying. — For juniors; seniors may elect. (*a*) Spraying materials, their composition, manufacture and preparation for use; the desirable and objectionable qualities of each material; formulas used, cost, tests of purity. (*b*) Spraying machinery, including all the principal types of pumps, nozzles, hose, and vehicles; their structure and care. (*c*) Orchard methods in the application of the various materials used, with the important considerations for spraying each fruit and for combating each orchard pest. This course is designed especially to familiarize the student with the practical details of actual spraying work in the orchard. Spray materials are prepared, spraying apparatus is examined and tested, old pumps are overhauled and repaired, and the actual spraying is done in the college orchards and small-fruit plantations.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Assistant Professor Drain.

Prerequisite, Pomology 53.

75. **I.** Systematic Pomology. — For seniors. A continuation of Course 54, with special reference to nursery variety certification, variety study of pears, grapes, plums, cherries, strawberries, raspberries, blueberries, and blackberries.
1 class hour. 3 2-hour laboratory periods, credit, 4.
Laboratory fee, $4.00. Assistant Professor Drain.
Prerequisite, Pomology 54.

77. **I.** Commercial Pomology. — For seniors. The picking, handling, storing and marketing of fruits, including a discussion of storage houses, fruit packages, and methods of grading and packing. Special emphasis is placed upon laboratory and field work, where the student is given actual practice in the picking and packing of most of the principal fruits.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Mr. Roberts.

Prerequisite, Pomology 53.

80. **I.** 81. **II.** 82. **III.** Seminar. — For seniors majoring in pomology. Advanced study of problems relating to the business of fruit growing. Each student is assigned a major problem in lines of work in which he is particularly interested. He pursues his studies both by reading and research, and the materials obtained will be worked into theses, which are presented to the seminar

for discussion. No lectures are given, but seminar meetings are held for one period each week.
1 class hour. Credit, 1.
The Department.

83. **II.** Geography and Economic Problems of the Fruit Industry. — For seniors; juniors may elect. This course considers the leading American and foreign centers of fruit production as they affect our own fruit industry through competition here or abroad. Particular reference is made to the economic position of fruit growing in New England and to the major factors influencing the industry here. The distribution of production costs in New England is studied with relation to costs in other regions and to the details of orchard management.
3 class hours. Credit, 3.
Professor Van Meter.
Prerequisite, Pomology 53.

84. **II.** Advanced Pomology. — For seniors. A critical survey of the scientific principles underlying orchard practices, with especial attention to recent research work in fruit growing. Textbooks, lectures, assigned readings, and field exercises.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Sears and Mr. Roberts.
Prerequisite, Pomology 53.

85. **III.** Advanced Pomology. — For seniors. As stated under Course 84.
3 class hours. Credit, 3.
Professor Sears and Mr. Roberts.
Prerequisite, Pomology 84.

Vegetable Gardening.

Professor Waugh, Assistant Professor Snyder and Mr. Stout.

The purpose of the courses is to train men (1) for all the commercial branches of vegetable and seed production, and (2) for the professional fields of research, extension work, and teaching.

Elective Courses.

50. **III.** General Vegetable Gardening. — For juniors; seniors may elect. A general consideration of fundamentals in vegetable production which may be applied to the growing of vegetables as a cash crop with other types of agriculture, the growing of vegetables in the home garden, agricultural instruction in secondary schools, and professional agricultural work other than teaching.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Assistant Professor Snyder.

51. **I.** Vegetable Gardening. — For juniors; seniors may elect. A study of the principles underlying vegetable production; the vegetable plant, soil and its treatment, plant food, seed and seedage.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor Snyder.

52. **II.** Vegetable Gardening. — For juniors; seniors may elect. A study of the principles underlying vegetable production; the vegetable plant and its responses to environmental conditions.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Mr. Stout.

53. **III.** Vegetable Gardening. — For juniors; seniors may elect. A study of the principles underlying vegetable production; methods of culture, storage, marketing, and pest control.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Assistant Professor Snyder.
Prerequisite, Vegetable Gardening 50, 51, or 52.

75. **I.** Systematic Vegetable Gardening. — For seniors. A critical study of variety identification; nomenclature and classification; judging and exhibiting.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Laboratory fee, $3.00. Assistant Professor Snyder.

76. **II.** Greenhouse Crops. — For seniors. A study of the principles underlying the culture of vegetables under glass.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Assistant Professor Snyder.

77. **III.** Commercial Vegetable Gardening. — For seniors. A critical study of the fundamental problems in the commercial production of vegetables. Visits to the leading market and truck sections in the state are required. Twenty-five dollars will cover such trips.
2 class hours. 1 2-hour laboratory period, credit, 3.
Assistant Professor Snyder.
Prerequisite, Vegetable Gardening 50, 51, or 52.

DIVISION OF SCIENCE.

Professor Gordon.

Bacteriology and Physiology.

Professor Gage, Assistant Professor Bradley, Miss Garvey.

The courses in bacteriology and physiology have been planned to furnish: (1) general training in these subjects for all college students, (2) training for those interested in agriculture, industries, and domestic science, (3) training for prospective students of human or veterinary medicine and public health, (4) training for teachers and laboratory workers in the biological sciences. The courses in bacteriology include introductory and general courses and advanced work, most of which precedes the applied bacteriology of agriculture, the arts, industry, domestic science, and public health. The course in physiology includes considerations of modern ideas on this subject in relation to human welfare.

BACTERIOLOGY.

Elective Courses.

30. **II.** Introductory Bacteriology. — For sophomores. As stated under Course 50.
2 3-hour laboratory periods, credit, 3.
Laboratory fee, $5.00. Assistant Professor Bradley and Miss Garvey.

50. **II.** Introductory and General Bacteriology. — For juniors; seniors may elect. Designed to make micro-organisms real and significant. An attempt is made to demonstrate their wide distribution and relationship to agriculture, arts, science, industries, and medicine. The course aims to provide an elementary basis for bacteriological study and interpretation and to furnish such material as will be valuable in understanding agriculture, domestic science, and public health problems.
2 3-hour laboratory periods, credit, 3.
Laboratory fee, $5.00. Assistant Professor Bradley and Miss Garvey.

51. **III.** Differential Bacteriology. — For juniors; seniors may elect. Morphological, cultural, and physiological aspects of micro-organisms are considered. Types of bacteria, their classification and identification, and their functions are studied. This course is fundamental to all advanced and extended microbiological studies.
6 laboratory hours, credit, 3.
Laboratory fee, $5.00. Professor Gage and Miss Garvey.
Prerequisite, Bacteriology 30 or 50.

60. **I.** Public Health. — For juniors; seniors may elect. Considers the relation of the human body to its environment in the maintenance of health and the production of disease. This study is based upon human anatomy and physiology. The individual, as a member of society, governed by natural laws, is also of fundamental importance. Animal and human diseases of public health significance are reviewed, their control considered, and their social values discussed.
3 class hours. Credit, 3.
Professor Gage.

61. **II.** Public Health. — For juniors; seniors may elect. Public health laws, organization, and the laboratory in relation to public health projects will be discussed. Vital statistics and their significance will be considered.
3 class hours. Credit, 3.
Professor Gage.
Prerequisite, Bacteriology 60.

62. **III.** Public Health. — For juniors; seniors may elect. Sanitation and its relation to agriculture and public health. The microbiological features of air, water, soil, sewage, refuse, and the control of municipal and rural sanitary projects will be considered.
3 class hours. Credit, 3.
Assistant Professor Bradley.
Prerequisite, Bacteriology 61.

75. **I.** Advanced Bacteriology. — For seniors; juniors may elect. This course will include advanced studies in the differentiation of micro-organisms, including serology as applied to classification and diagnosis. This course prepares for the study of more advanced agricultural, domestic science, and public health problems.
10 laboratory hours, credit, 5.
Laboratory fee, $5.00. Professor Gage and Miss Garvey.
Prerequisite, Bacteriology 51.

80. **I.** Dairy Bacteriology. — For seniors; juniors may elect. Special emphasis is placed upon milk supplies. The microbial content of milk, its source, its significance, its control; microbial taints and changes in milk; groups or types of organisms found in milk; milk as a carrier of disease-producing organisms; the value of clarification, centrifugal separation, temperature, pasteurization; the abnormal fermentations of milk; bacteriological milk standards and their interpretation; ripening of milk and cream; the bacterial content of butter; a survey of the microbiology of cheeses; a study of special dairy products, such as ice cream and artificial milk drinks.
2 3-hour laboratory periods, credit, 3.
Laboratory fee, $5.00. Assistant Professor Bradley.
Prerequisite, Bacteriology 50.

81. **II.** Food Bacteriology. — For seniors; juniors may elect. A study of the principles of food preservation and food conservation by means of drying, canning, refrigerating, and addition of chemicals. Food fermentations, as illustrated by bread, vinegar, etc., are examined. Decomposition of foods, as may be seen in meat, oysters, fish, milk, etc., as well as diseased and poisonous foods, receive consideration. Contamination of food supplies by means of water, sewage, handling, exposure, diseased persons, etc., is of especial significance and is demonstrated by laboratory exercises. Laboratory inspection of foods is now a subject of great import and is given attention.
2 3-hour laboratory periods, credit, 3.
Laboratory fee, $5.00. Assistant Professor Bradley.
Prerequisite, Bacteriology 50.

82. **III.** Soil Bacteriology. — For seniors; juniors may elect. Such subjects as the number and development of micro-organisms in different soils; the

factors which influence their growth; food, reaction, temperature, moisture, and aeration; the changes wrought upon inorganic and organic matter in the production of soil fertility, ammonification, nitrification, and denitrification; fixation of nitrogen symbiotically and non-symbiotically; methods of soil inoculation receive attention.

2 3-hour laboratory periods, credit, 3
Laboratory fee, $5.00. Assistant Professor Bradley.
Prerequisite, Bacteriology 50.

Physiology.

Elective Courses.

33. **III.** General Physiology. — For sophomores; juniors and seniors may elect. As stated under Course 63.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Gage.

63. **I.** General Physiology. — For juniors; seniors may elect. The object of this course shall be to adapt the elements of physiology to the modern viewpoint. The relationship and influence of experimental biology, physical chemistry, and biochemistry upon physiology will be considered. The course is planned as an introductory course for those who wish to study physiology in its essentials but lack extensive preparation. Applications and demonstrations will be made of the practical side of nutrition, exercise, mental work, fatigue, and respiration as they relate to conservation of human and animal life.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Gage.

64. **II.** General Physiology. — For juniors; seniors may elect. Physiology of nutrition with special reference to intermediate and basal metabolism. Introductory work on nerves and nerve action, and a more detailed consideration of internal and external respiration.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Gage.
Prerequisite, Physiology 33 or 63.

65. **III.** General Physiology. — For juniors; seniors may elect. Physiology of the circulation, absorption, and excretion, with special reference to gross and microscopic anatomy. This course is especially planned for students who expect to major in subjects pertaining to plant and animal life.
2 class hours. 1 2-hour laboratory period, credit, 3.
Professor Gage.
Prerequisite, Physiology 64.

Botany.

Professor Osmun, Associate Professor Clark, Assistant Professor McLaughlin, Assistant Professor Torrey, Assistant Professor Davis.

The required courses in botany are planned to present a knowledge of the principles of plant life both for their fundamental importance in agriculture and for their general educational value. Elective courses are of two types: (1) those which have for their chief aim the direct support of technical courses in agriculture and horticulture, and (2) those providing broader, more intensive training in the science. Courses in the second group may lead to specialization in the field. They also furnish excellent training for the specializing in other sciences and in scientific agriculture. In all undergraduate courses the relation of the science of botany to agriculture is emphasized.

Required Courses.

[Courses 3 and 25 constitute a general elementary course in the botany of higher plants, and are required of all students; Course 26 is advised for all who intend to study further in the department.]

3. **III.** Introductory Botany. — For freshmen. Presents the seed plants as plastic organisms molded by their environment. Also introduces the student to methods of identifying and classifying plants.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Laboratory fee, $1.50.
Assistant Professor Torrey and Associate Professor Clark.

25. **II.** Introductory Botany. — For sophomores. The anatomy and physiology of seed plants (Phanerogamia).
1 class hour. 2 2-hour laboratory periods, credit, 3.
Laboratory fee, $1.50.
Prerequisite, Botany 3.
Assistant Professor Torrey and Associate Professor Clark.

Elective Courses.

26. **III.** Cryptogamic Botany. — For sophomores; juniors and seniors may elect. Selected forms typifying the principal groups of lower plants are studied in the laboratory. Especial attention is given to the bacteria and fungi and in connection with these a few representative plant diseases are studied with a view to acquainting the student with the role of these organisms as causes of disease in higher plants. The course has a two-fold purpose: (1) it is intended for students who desire to extend their knowledge to the principal branches of the plant kingdom, thus rounding out a general course of which Botany 3 and 25 constitute the first two parts; (2) the course is also planned as an introduction to the study of plant diseases by those students who expect to enter some branch of plant industry.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Laboratory fee, $1.50. Professors Osmun, McLaughlin, and Davis.
Prerequisite, Botany 25.

50. **I.** 51. **II.** Diseases of Crops. — For juniors; seniors may elect. In order to permit students to specialize on the diseases of crops which are most closely related to their majors or in which they are especially interested, the course is divided for lecture and laboratory work into the following sections: (I) diseases of truck and field crops; (II) diseases of floricultural crops and ornamentals; (III) diseases of fruit crops; (IV) diseases of shade and forest trees; (V) (51 II only) the outstanding diseases of each crop group, for students majoring in entomology. Sections I–IV each consist of one lecture and one two-hour laboratory period per week and may be elected in each term in units of one, two, or three sections. Section V is offered in the second term only, consists of one conference hour and two two-hour laboratory periods per week, and may not be combined with any of sections I–IV.
1, 2, or 3 class hours. 1, 2, or 3 2-hour laboratory periods, credit, 2, 3, 4, or 6.
Laboratory fee, $2.00 per term. Assistant Professor McLaughlin.

52. **I.** 53. **II.** 54. **III.** Systematic Mycology. — For juniors; seniors may elect. Morphology and development of typical species representing the orders and families of fungi; practice in identification, collection, and preservation of fungi; study of systems of classification; collateral reading. A prerequisite of the senior course in plant pathology, but open to all.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Laboratory fee, $2.00 per term. Assistant Professor Davis.
Prerequisite, Botany 26.

55. **III.** Plant Histology. — For juniors; seniors may elect. Comparative study of the tissues of plants; training in histological methods, including the use of precision microtomes, methods of killing, fixing, sectioning, staining, and

mounting; collateral reading and conferences. This course offers valuable training in preparation for further work in botany.
5 2-hour laboratory periods, credit, 5.
Laboratory fee, $3.00. Assistant Professors McLaughlin, Torrey, and Davis.
Prerequisite, Botany 3 and 25.

58. **I.** 59. **II.** 60. **III.** Systematic Botany of the Higher Plants (1928–29). — For juniors and seniors. An intensive study of gymnosperms and angiosperms. Lectures deal with the interrelations of the flowering plants and with their ecology, distribution and economic importance. Laboratory work consists of a critical study of types from the most important natural plant families. Particular emphasis is laid on the flora of Massachusetts. The department herbarium and greenhouses supply material of important tropical forms for study. Alternate with Courses 61, 62, and 63.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $1.50 per term. Assistant Professor Torrey.

61. **I.** 62. **II.** 63. **III.** The Comparative Anatomy of Green Plants (1929–30). — For juniors and seniors. In the lectures an intensive study is directed to the comparative anatomy of green plants from the evolutionary standpoint. Particular emphasis is laid upon the woody forms both living and extinct. Of the latter, the department is fortunate in possessing excellent sets of micro-preparations and lantern slides. Alternate with Courses 58, 59, and 60.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $1.50 per term. Assistant Professor Torrey.
Prerequisite, Botany 26.

75. **I.** 76. **II.** 77. **III.** Plant Pathology. — For seniors. Comprehensive study of diseases of plants; training in laboratory methods and technique, including culture work and artificial inoculation of hosts; miscellaneous diagnosis; study of literature and representative life histories of pathogens. Prepares for civil service, experiment station and college work.
1 class hour. 4 2-hour laboratory periods, credit, 5.
Laboratory fee, $3.00 per term. Professors Osmun and Davis.
Prerequisite, Botany 54.

78. **I.** Plant Physiology. — For seniors. Study of the factors and conditions of (*a*) plant nutrition, including the taking up of water and mineral substances, the assimilation of carbon and nitrogen, and the release of energy due to the processes of dissimilation; (*b*) plant growth, including the influence of internal and external factors on growth, the development of reproductive and vegetative organs; (*c*) plant movements, including those due to the taking up of water, and those of both motile and fixed forms in response to external stimuli. Weekly conferences are held at which students report on assignments to original sources in the literature.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Laboratory fee, $3.00. Associate Professor Clark.
Prerequisites, Botany 26; Chemistry 51.

79. **II.** 80. **III.** Plant Physiology. — For seniors. As stated under Course 78.
2 class hours. 1 or 3 2-hour laboratory periods, credit, 3 or 5.
Laboratory fee, $3.00 per term. Associate Professor Clark.
Prerequisite, Botany 78 for the 5-credit course; Botany 25 for the 3-credit course.

Chemistry.

Professor Chamberlain, Professor Peters, Assistant Professor Serex, Mr. Butts.

In teaching the courses in chemistry, emphasis is laid on both their educational and their vocational value. The courses in the freshman year deal with fundamental principles and give the student such an understanding of the subject as will enable him to appreciate the relation of chemistry to agriculture. The more advanced courses, including quantitative analysis, organic, physiological and physical chemistry, are for those who intend to become teachers and workers in the allied sciences, or who desire to follow agricultural chemistry as a vocation. Those completing the undergraduate courses are fitted for positions in the agricultural industries — fertilizer, feed, and insecticide manufacture — as well as in other lines of industry, and in the State experiment stations, in commercial laboratories, and in high school teaching. Postgraduate students are prepared for positions as teachers in colleges, and for more advanced positions in industry and in the experiment stations.

Required Courses.

1. **I.** 2. **II.** General Chemistry. — For freshmen who do not present chemistry for entrance and who begin the subject in college. It presents an introduction to the fundamental chemical laws, together with a study of the typical acid- and base-forming elements and their compounds. The second term contains some of the material given in Courses 4 and 5.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Laboratory fee, $3.00 per term. Mr. Butts.

4. **I.** Advanced General Chemistry. — For freshmen who present chemistry for entrance. A review of general chemistry centered, for the most part, about the laboratory work, which takes the synthetic form. Substances of agricultural importance are prepared in quantity and studied in detail by the student. These include ammonium sulfate, superphosphate, muriate and sulfate of potash, arsenate of lead, Paris green, Bordeaux mixture, lime-sulfur, and emulsions.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Laboratory fee, $3.00. Professor Peters.
Prerequisite, Entrance Chemistry.

5. **II.** Inorganic Agricultural Chemistry. — A continuation of Course 4, for freshmen who present chemistry for entrance. A study of the chemical composition, properties, and reactions of soils, fertilizers, fungicides, and insecticides. The laboratory work is divided into three parts: (*a*) qualitative examination of soil, plant ash, and superphosphate; (*b*) approximate quantitative determination of moisture, ash, carbonic acid, phosphoric acid, potash, nitrogen, etc., in farm crops, soils, and fertilizers; (*c*) special work on retention of salts by soil, leaching of lime from the soil by carbonated water, etc.
2 class hours. 2 2-hour laboratory periods, credit, 4.
Laboratory fee, $3.00. Assistant Professor Serex.
Prerequisite, Chemistry 4.

Elective Courses.

25. **II.** Qualitative Analysis. — *Basic.* — For sophomores. The systematic analysis of metallic salts, presented from the ionic viewpoint. A close study of the tests used in the separation and identification of the metals, and the application of these tests to unknown mixtures. This course should be taken by all intending to follow chemistry as a vocation.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Laboratory fee, $4.00. Assistant Professor Serex.
Prerequisite, Chemistry 2 or 5.

26. **III.** Qualitative Analysis. — *Acidic.* — For sophomores. A continuation of Course 25.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Laboratory fee, $4.00. Assistant Professor Serex.

30. **II.** Organic Agricultural Chemistry. — For sophomores; juniors and seniors may elect. Embraces the study of the most important groups of organic compounds of plants and animals, the composition of plants, the chemistry of

plant growth, plants as food and as industrial material, the composition of animals, the chemistry of digestion, also the study of some of the products related to plants and animals, such as milk, butter, cheese, sugar, and alcohol. The treatment of the subject is general, avoiding (so far as possible) complicated chemical facts and relationships, and endeavoring simply to make the student acquainted with the general chemistry of plants and animals and agricultural processes and products.
3 class hours. Credit, 3.
Professor Chamberlain.

51. **I.** 52. **II.** 53. **III.** Organic Chemistry. — For juniors; seniors may elect. A systematic study, both from texts and in the laboratory, of the more important compounds in the entire field of organic chemistry. Especial attention is given to those compounds which are found in agricultural products or are manufactured from them. These include alcohols, acids, esters, fats, carbohydrates, and proteins. In the third term compounds in the benzene series are considered. The work forms a foundation for courses in physiological chemistry and agricultural analysis, and is especially planned for those majoring in chemistry or the other sciences.
3 class hours. 2 3-hour laboratory periods, credit, 6.
Laboratory fee, $5.00 per term. Professor Chamberlain.
Prerequisite, Chemistry 2 or 5. Chemistry 26 is prerequisite for those majoring in chemistry.

61. **I.** Quantitative Analysis. — For juniors; seniors may elect. The course includes the gravimetric determination of chlorides, sulfates, iron; the volumetric analysis of acids and bases; and the dichromate method for iron.
1 class hour. 2 4-hour laboratory periods, credit, 5.
Laboratory fee, $5.00. Professor Peters.
Prerequisite, Chemistry 25. Chemistry 26 is prerequisite for those majoring in chemistry.

62. **II.** For juniors; seniors may elect. A continuation of Course 61. A study of potassium permanganate as a volumetric reagent; limestone is analyzed; phosphorus is determined in soil; and the perchlorate method for potash is carried out. Analytical problems are a part of the work.
2 class hours. 2 4-hour laboratory periods, credit, 6.
Laboratory fee, $5.00. Professor Peters.

63. **III.** For juniors; seniors may elect. A continuation of Course 62. A study of the oxidation reactions of iodin and the precipitating reactions of thiocyanate; the analysis of Paris green and lead arsenate. The work closes with water analysis. By means of assigned readings students are shown the importance of library work.
1 class hour. 2 4-hour laboratory periods, credit, 5.
Laboratory fee, $5.00. Professor Peters.

75. **I.** Physical Chemistry. — For seniors. A study of the fundamental theories and laws of physical chemistry, together with laboratory work which includes the important methods of physicochemical measurements.
3 class hours. 6 laboratory hours, credit, 6.
Laboratory fee, $5.00. Assistant Professor Serex.
Prerequisite, Chemistry 61.

80. **I.** Physiological Chemistry. — For seniors. Supplementary to Courses 51, 52, and 53. To those who expect to take up scientific work in microbiology, botany, agronomy, animal husbandry, etc., and who have had Courses 51, 52, and 53, it gives acquaintance with the chemistry of the physiological processes in plants and animals, by means of which some of the important organic compounds studied in Courses 51, 52, and 53 are built up in the living organism or are used as food by it. In the lectures, the study of food and nutrition as related to both

human and domestic animals is the principal subject. In the laboratory, experimental studies are made of the animal body and of the processes and products of digestion, secretion, and excretion.
3 class hours. 2 2-hour laboratory periods, credit, 5.
Laboratory fee, $4.00. Mr. Butts.

81. **II.** Food Analysis. — For seniors. Primarily the analytical study of milk and butter. May also include the analysis of other food stuffs for nutritive value or for impurities.
1 class hour. 2 4-hour laboratory periods, credit, 5.
Laboratory fee, $5.00. Mr. Butts.
Prerequisite, Chemistry 61.

86. **II.** Review of General Chemistry. — For seniors. Primarily for students majoring in chemistry; others may elect by permission of the instructor. A knowledge of physical chemistry is desirable. The review of general chemistry is largely theoretical. Some subjects may be enlarged by special lectures, such as atomic structure, Werner's co-ordination theory, crystal structure as shown by X-rays.
3 class hours. Credit, 3.
Professor Peters.

87. **III.** History of Chemistry. — For seniors. An historical and biographical study of chemistry and chemists. The aim of the course is: (1) to give the student a comprehensive view of the science as a whole, through a study of the development of new ideas and the establishment of new theories and laws; and (2) to arouse an enthusiastic interest in the subject and an appreciation of the true spirit of scientific research, through a sympathetic presentation of the work and lives of the great chemists who have been the creators of the chemistry of today. The course will consist of lectures, supplemented by systematic correlated reading, and the preparation of reports or essays.
3 class hours. Credit, 3.
Professor Chamberlain.

90. **II.** 91. **III.** Special Work in Chemical Problems. — For seniors. An assignment is made to each student and he is expected to learn how research is done. The problem may be in analytical, general, agricultural, or industrial chemistry, and is to be continued for two terms.
1 class hour. 8 laboratory hours, credit, 5.
Laboratory fee, $5.00 per term. Professor Peters.

92. **II.** 93. **III.** Special Work in Organic Chemistry. — For seniors. In this course, as in Courses 90 to 97, the student may give his attention primarily to one line of chemical study for the purpose of becoming acquainted with methods of research. To those whose tastes and interests are in connection with the organic problems of agricultural chemistry, many subjects of study present themselves, among which may be mentioned: proteins, carbohydrates, fats; organic nitrogenous compounds in fertilizers and soils and their relation to plants; the commercial production of alcohol from agricultural products; dyes, synthetic medicines, perfumes, etc.
1 class hour. 8 laboratory hours, credit, 5.
Laboratory fee, $5.00 per term. Professor Chamberlain.
Prerequisites, Chemistry 51, 52, 53, and 80.

94. **II.** 95. **III.** Special Work in Physical Chemistry. — For seniors. The field of agricultural chemistry offers many problems that have been attacked through the methods of physical chemistry; such, for example, are the hydrolysis of salts and of minerals and the absorption of salts and fertilizers by soils. This course is designed to familiarize the student with the literature on a special topic, and to give an insight into the methods of research. Each student selects one line of work and follows it through the course, repeating some of the original

work. Students interested in colloid chemistry may make a brief study of fundamentals during the first term of this course, with the ultimate object of selecting a problem along this line for the second term.
1 class hour. 8 laboratory hours, credit, 5.
Laboratory fee, $5.00 per term. Assistant Professor Serex.
Prerequisite, Chemistry 75.

96. **II.** 97. **III.** Special Work in Physiological and Food Chemistry. — For seniors. An opportunity for those so interested to pursue the study of some physiological or food problem. This course is intended to familiarize the student with the nature of research under the careful supervision of the instructor. The problems of physiological chemistry are of a varied and interesting character.
1 class hour. 8 laboratory hours, credit, 5.
Laboratory fee, $5.00. Mr. Butts.
Prerequisite, Chemistry 80.

Entomology.

Professor Fernald, Professor Crampton, Assistant Professor Alexander, Mr. Farrar, Mr. Salman.

Courses in entomology are for two purposes: (1) The introductory courses aim to give the students a general knowledge of insects, particularly in their relations to man, his crops, his domestic animals, and his health. (2) Later courses are intended to train students desiring to specialize in entomology to become United States, State, or experiment station entomologists, teachers, foresters, tree wardens, entomologists connected with insecticide-manufacturing companies, consulting entomologists, or to occupy other positions where an expert knowledge of insects is called for. The beekeeping courses are offered with the following aims: (1) To meet the increase in vocational opportunities for the production of bees or honey as a business. (2) To study the beekeeping needs of fruit and truck-crop industries and the part that bees play in pollinating flowers. (3) To acquaint the student with a recreational field of many phases, which can be made profitable.

Elective Courses.

26. **I.** General and Economic Entomology. — Primarily for sophomores; juniors and seniors may elect. For students who desire some knowledge of insects but who cannot give more than one term to the subject; also an introduction to the later courses for those who intend to follow entomology further. Touches briefly upon the structure of insects so far as this is needed for such a course; deals with metamorphosis and classification to the larger groups, and discusses the most important methods and materials used for control. The greater part of the time is devoted to special study of the most important insect pests, particularly of New England, showing their modes of life, the injuries they cause, and the best methods of control. In this way the most serious pests of fruit trees, ornamental trees and shrubs, market-garden and green-house crops, field crops, animals, and man are treated.
3 class hours. Credit, 3.
Professor Fernald.

28. **III.** General and Economic Entomology. — For sophomores intending to major in one of the biological sciences; juniors and seniors admitted by permission of instructor in charge. Three class-room exercises to about May 1; thereafter three field exercises per week. In the field the work of insects found will be studied and a collection of insects made. Methods of collecting, preparing, and mounting insects for collections will be taught. In the class room until about May 1, studies preparatory to the field work will be given. Class limited.
3 class hours to about May 1; thereafter, 3 2-hour laboratory periods, credit, 3.
The Department.
Prerequisite, Entomology 26.

50. **I.** 51. **II.** Pests of Special Crops. — For juniors and seniors not majoring in entomology. The work may be begun in either the fall or the winter term, and may be continued through the winter term by students beginning in the fall. The laboratory work is largely individual in these courses. Students majoring in subjects other than entomology, who desire a more complete knowledge of the insects connected with their own major lines of work, can obtain it through these courses. A student majoring in pomology, for example, will devote his time in this course to a careful study of the insects injuring the fruit trees in which he is interested, learning how to recognize their different stages, their work, and the best methods for their control. Work of this kind is available on the insects attacking field crops, market-garden crops, tree fruits, small fruits, shade trees and shrubs, forest trees, flowers, the domestic animals, household articles, and man.

3 2-hour laboratory periods, credit, 3.
Laboratory fee, $1.00 per term. Professor Fernald and Mr. Salman.

52. **I.** Classification of Insects. — For juniors specializing in entomology. Laboratory work on the identification and classification of insects of various groups.

2 2-hour laboratory periods, credit, 2.
Laboratory fee, $1.00. Assistant Professor Alexander.
Accompanying Entomology 53.

53. **I.** Insect Morphology. — For juniors specializing in entomology and for other juniors or seniors having the prerequisite. The lectures treat of the external and internal anatomy of insects, particularly those parts used in identification, a knowledge of which is needed in the accompanying Course 52. In the laboratory the external anatomy of the most important groups is studied, with emphasis on the characters used in learning the names of insects, and on the methods of using analytical keys.

2 class hours. 3 2-hour laboratory periods, credit, 5.
Laboratory fee, $1.00. Professor Crampton.
Prerequisite, Entomology 26.

55. **II.** Continuation of Course 52. A part of the time is devoted to a study of insects concerned in conveying diseases of man and other animals.

4 2-hour laboratory periods, credit, 4.
Laboratory fee, $1.00. Professors Crampton and Alexander.

56. **II.** Pests of Special Crops. — For juniors majoring in entomology. Individual laboratory work on the most important insect pests of this country, and the preparation and presentation of bulletin material on them.

3 2-hour laboratory periods, credit, 3.
The Department.

57. **III.** Classification of Insects. — Continuation of Course 55.

2 2-hour laboratory periods, credit, 2.
Laboratory fee, $1.00. Assistant Professor Alexander.

75. **III.** Forest and Shade-tree Insects. — For juniors; seniors may elect. The lecture work deals with the principles and methods of controlling insects which attack forests and forest products, shade trees, etc. The laboratory periods are devoted to a study of the more important species, their identification, biology, and specific control measures. Field work supplements laboratory study if time permits. One entire Saturday for field excursion also required.

1 class hour. 3 2-hour laboratory or field periods, credit, 4.
Laboratory fee, $2.00. Assistant Professor Alexander.
Prerequisites, Entomology 26; 52 and 53 desirable.

76. **I.** Advanced Entomology. — For seniors. Studies on insect bionomics; scale insects, their structure, habits, methods of mounting, identification, etc.; internal anatomy and organology.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Laboratory fee, $3.00. Professors Crampton and Alexander.
Prerequisite, Entomology 55.

77. **II.** Advanced Entomology. — For seniors. Studies of the life history, habits, and methods of control of the important insect pests of the United States; recognition tests of these pests and an examination of the literature on them; methods of bulletin preparation.
3 2-hour laboratory periods, credit, 3.
Laboratory fee, $1.00. Assistant Professor Alexander.
Prerequisite, Entomology 76.

78. **III.** Advanced Entomology. — For seniors. Classification of insects and of their early stages; principles of classification, the use of literature on entomology, and the preparation of bibliographies and indices; the enemies of insects.
1 class hour. 3 2-hour laboratory or field periods, credit, 4.
Laboratory fee, $2.00. Professors Fernald, Crampton, and Alexander.
Prerequisite, Entomology 77.

79. **I.** Insecticides and their Application. — For seniors; juniors may elect. Lectures on the composition, preparation, and methods of application of insecticides; other control measures.
3 class hours. Credit, 3.
Professor Fernald.
Prerequisite, Entomology 26.

90. **II.** Evolution. — For seniors; juniors may elect. In order to demonstrate the universal scope and operation of the laws of evolution, the course includes a brief sketch of the probable origin and evolution of matter as viewed in the light of modern physical and chemical research; the evolution of the solar system, leading to the formation of the earth; the changes in the earth, preparatory to the production of life; the physical and chemical basis of life; the probable steps in the formation of living matter, and the theories concerning it; the evolution of living things; the developmental history of man, and of the races of mankind; the evolution of human intelligence, languages, culture, institutions, etc., and man's probable future in the light of his past development. Especial consideration is given to the factors of evolution, the basic principles of heredity, variation, and similar topics, with particular reference to their application to human welfare; and the recent contributions in the field of entomology to the advancement of our knowledge of these fundamental principles are briefly reviewed.
3 class hours. Credit, 3.
Professor Crampton.

BEEKEEPING.

Elective Courses.

65. **III.** Introductory Beekeeping. — For juniors; seniors may elect. A detailed study is made of the bee colony, including its organization, the life of its individuals in relation to the colony, and the cycle of the year. Attention is given to practical methods of managing colonies during the spring and early summer. Spring pollen, nectar flora, and the use and needs of bees for horticulturists are other phases of the work covered. The laboratory work provides a study of beekeeping equipment; individual manipulation and an understanding of colony development is afforded. To be complete, this course should be followed by Course 85.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Mr. Farrar.

85. **I.** Introductory Beekeeping. — For seniors. The work begun in Course 65 is continued for the completion of the beekeeping year, including late summer and fall management, wintering, and care and marketing of the crop. A more detailed study is made of regional differences, methods, and requirements for different types of honey production.
2 class hours. 1 2-hour laboratory period, credit, 3.
Mr. Farrar.
Prerequisite, Entomology 65.

86. **II.** Advanced Beekeeping. — For seniors. Advanced studies are made of important beekeeping problems, including anatomy and physiology; senses and bee behavior; soil and climatic factors influencing nectar secretion; kinds, importance, and distribution of pollen and nectar sources; bee disease control; marketing problems; queen rearing and commercial bee production. Parts of this work are made individual, depending on the needs of the student.
2 class hours. 1 2-hour laboratory period, credit, 3.
Mr. Farrar.
Prerequisite, Entomology 85.

Mathematics and Civil Engineering.

Professor Ostrander, Professor Machmer, Assistant Professor Moore, Mr. Boutelle.

The work of the freshman year is required. It is intended to furnish the necessary drill and groundwork needed for many of the scientific and practical courses of other departments. Thoroughness and accuracy are insisted upon. The advanced work in mathematics is taught from a practical standpoint, and many of its applications to other subjects are given. The courses in surveying and civil engineering are given to furnish the groundwork for a professional career. Special emphasis is given to the subjects bearing on highway construction and maintenance.

Required Courses.

1. **I.** Higher Algebra. — For freshmen. A brief review of radicals, quadratic equations, ratio and proportion, and progressions; graphs, binomial theorem, summation of series, variation, determinants, permutations and combinations, logarithms, and theory of equations.
3 class hours. Credit, 3.
Professors Machmer, Moore, and Mr. Boutelle.

2. **II.** Mathematical Analysis. — For freshmen. A review of methods of computation, with special emphasis on short processes and the making of close approximations. A study of some of the different modes of variation; finding the exact or approximate relations (equations) between the varying quantities, particularly as illustrated by the use of the graph. Also a study of the properties of closed figures, such as polyhedra, cylinders, cones, and the sphere, and calculations of their surfaces and volumes. An effort is made to apply mathematical processes directly to the work given in the various technical departments of the college.
3 class hours. Credit, 3.
Professors Machmer, Moore, and Mr. Boutelle.

3. **III.** Plane Trigonometry. — For freshmen. The trigonometric functions as lines and ratios; proofs of the principal formulas, transformations; inverse functions, use of logarithms; the applications to the solution of right and oblique triangles; practical applications; trigonometric equations.
3 class hours. Credit, 3.
Professors Machmer, Moore, and Mr. Boutelle.

26. **II.** Plane Surveying. — For sophomores; juniors and seniors may elect. The elements of the subject, including the adjustment and use of the usual instruments. Textbook and lectures.
3 class hours. Credit, 3.
Professors Ostrander and Moore.

27. **III.** Plane Surveying. — For sophomores; juniors and seniors may elect. As stated under Course 26. Includes field work.
3 2-hour laboratory periods, credit, 3.
Laboratory fee, $1.50. Professors Ostrander and Moore.
Prerequisite, Mathematics 26.

50. **I.** Analytical Geometry. — For juniors; seniors may elect. A discussion of the geometry of the line, the circle, conic sections, and the higher plane curves.
3 class hours. Credit, 3.
Professor Machmer.
Prerequisites, Mathematics 1, 2, and 3.

51. **II.** 52. **III.** Differential and Integral Calculus. — For juniors; seniors may elect. A first course in the subject, with some of the more important applications to applied sciences.
5 class hours. Credit, 5.
Assistant Professor Moore.
Prerequisites, Mathematics 1, 2, and 3.

53. **II.** Elementary Structures. — For juniors; seniors may elect. An elementary course in roofs and bridges. Textbook and lectures.
3 class hours. 1 2-hour laboratory period, credit, 4.
Professor Ostrander.

75. **I.** Hydraulics and Sanitary Engineering. — For seniors; juniors may elect. Hydrostatics, theoretical hydraulics, orifices, weirs, pipes, conduits, water supply, hydraulic motors, sewers and sewage treatment. Textbook and lectures.
5 class hours. Credit, 5.
Professor Ostrander.

76. **I.** Materials of Construction. Foundations and Masonry Construction. — For seniors; juniors may elect. Textbook and lectures.
5 class hours. Credit, 5.
Professor Ostrander.

77. **II.** Roads and Railroads. — For seniors; juniors may elect. Topographic and higher surveying, highway construction, earthwork, pavements, and railroad construction. Textbook and lectures.
3 class hours. Credit, 3.
Professor Ostrander.

78. **III.** Roads and Railroads. — For seniors; juniors may elect. As stated under Course 77.
3 2-hour laboratory periods, credit, 3.
Laboratory fee, $1.50. Professor Ostrander.
Prerequisite, Mathematics 77.

Physics.

Professor Powers, Assistant Professor Alderman.

The courses in this department present a basic study of the physical laws and phenomena of nature with special emphasis on the application of the principles studied to other sciences. These courses furnish satisfactory training for pre-medical students and for prospective teachers in secondary schools. Courses 25, 26, and 27 constitute a study in general physics. The other courses afford opportunity for more advanced and individual work.

Elective Courses.

25. **I.** MECHANICS. — For sophomores; juniors and seniors may elect. This course is largely a study of the following and related topics: equilibrium of bodies; forms of energy and work; types of motion; fluids; surface tension; molecular phenomena; elasticity; wave-motion.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Professors POWERS and ALDERMAN.

26. **II.** MAGNETISM AND ELECTRICITY. — For sophomores; juniors and seniors may elect. Includes magnetism, electrostatics, production and properties of electric currents, electrical appliances and machines, oscillatory circuits, vacuum-tubes, and related topics.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Professors POWERS and ALDERMAN.

27. **III.** HEAT AND LIGHT. — For sophomores; juniors and seniors may elect. Thermometry, expansion, hygrometry, transmission of heat, changes of state, radiation; wave theory of light, optical instruments, analysis of light, interference, polarization; allied subjects.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Professors POWERS and ALDERMAN.

50. **I.** 51. **II.** 52. **III.** MAGNETISM, ELECTRICITY, PHOTO-ELECTRICITY, THERMIONICS, AND APPLICATIONS. — For juniors and seniors. Course 50 deals largely with direct currents, Course 51 with alternating currents, and Course 52 with applications of thermionics and photo-electricity. These courses are planned to give the student a good grounding in theory and methods of measurement in the subjects indicated, which will be useful in many fields of investigation. Modern methods are stressed and instruments of precision are used.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00 per term. Professors POWERS and ALDERMAN.
Prerequisites, Physics 26 for Courses 50 and 51; Physics 51 for Course 52.

55. **III.** OPTICS. — For juniors and seniors. This course comprises a study of the theory and use of lenses, the eye, telescope, spectrometer, and other optical instruments.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. Assistant Professor ALDERMAN.
Prerequisite, Physics 27.

75. **I.** 76. **II.** 77. **III.** ADVANCED EXPERIMENTAL WORK IN SELECTED TOPICS. — For seniors. These courses are largely experimental, and the subject matter is adapted to the needs of the individual student. The research viewpoint is emphasized.
3 2-hour laboratory periods, credit, 3.
Laboratory fee, $2.00 per term. Professor POWERS.
Prerequisites, Physics 25, 26, 27, 50, 51, and 52; Mathematics 51 and 52.

Veterinary Science.

Professor LENTZ.

The courses in veterinary science have been arranged to meet the needs (1) of students who propose following practical agriculture; (2) of prospective students of human and veterinary medicine; and (3) of teachers and workers in the biological sciences.

Elective Courses.

50. **II.** Veterinary Hygiene. — For juniors; seniors may elect. Acquaints students with the influences which air, water, feed, light, disposal of animal waste material, etc., may have upon the health of animals and upon the health of those who use both animals and animal products.
5 class hours. Credit, 5.
Professor Lentz.

75. **I.** Comparative Veterinary Anatomy. — For seniors; juniors may elect. The structure of the horse is studied and the structure of the other farm animals compared with it. This is a lecture and demonstrational course — not dissection — and is essential for students who wish to elect Veterinary 77.
5 class hours. Credit, 5.
Professor Lentz.

76. **II.** General Veterinary Pathology. — For seniors; juniors may elect. A study of fundamental, general pathological conditions; inflammation, fever, hypertrophy, atrophy, etc., a knowledge of which is essential in the prevention, diagnosis, and treatment of disease. Materia medica, therapeutic measures, and poisonous plants are considered briefly.
5 class hours. Credit, 5.
Professor Lentz.

77. **III.** Applied General Veterinary Pathology. — For seniors; juniors may elect. A continuation of Course 76, with specific application of principles to etiology, pathogenesis, and prophylaxis of communicable and non-communicable diseases of domesticated animals.
5 class hours. Credit, 5.
Professor Lentz.
Prerequisite, Veterinary 75.

85. **I.** Avian Pathology. — For seniors; juniors may elect. A course in poultry diseases. The object is to present information concerning the common diseases of poultry, their etiology, diagnosis and prevention. Consists of a systematic study of the diseases of the alimentary tract, liver, and abdominal region, followed by a study of the diseases of the respiratory system, circulation, and kidneys. The important disease-producing external and internal parasites are considered; also diseases of the skin and reproductive organs. Lectures and demonstrations. Not given 1928–29.
2 3-hour laboratory periods, credit, 3.
Laboratory fee, $2.00. The Department.

86. **II.** 87. **III.** Avian Pathology. — For seniors; juniors may elect. As stated under Course 85, also devoted to the study of some of the special diseases of poultry. Recent methods used in the control of these diseases are considered and opportunity offered the student for demonstrating various disease processes by means of prepared slides. Lectures, demonstrations, and laboratory work. Not given 1928–29.
2 3-hour laboratory periods, credit, 3.
Laboratory fee, $2.00 per term. The Department.
Prerequisite, Veterinary 85.

89. **II.** Avian Pathology. — For seniors; juniors may elect. This is a lecture course devoted to principles of pathology, with specific application to avian diseases. Etiology, pathogenesis, and prophylaxis will be emphasized. Offered for the year 1928–29.
3 class hours. Credit, 3.
Professor Lentz.

Zoology and Geology.

Professor Gordon, Mr. Gilbert.

The courses offered in zoölogy and geology stress the basic principles of these sciences and, so far as possible, emphasize practical as well as general educational values. The design of the courses listed under "Special Zoölogy" is to serve students according to their needs.

ZOOLOGY.

Elective Courses.

26. **I.** Elements of Zoology. — For sophomores; juniors and seniors may elect. This course deals with a few of the basic principles of animal biology, with the purpose of giving in some measure a preparation for subsequent studies which assume an acquaintance with the general phenomena of animal life.
2 class hours. 1 2-hour laboratory period, credit, 3.
Laboratory fee, $2.00. The Department.

53. **I.** Elements of Microscopic Technique. — For juniors; seniors and graduate students may elect. The student is taught by means of practical exercises the usual methods of preparing animal tissues for microscopic examination.
3 2-hour laboratory periods, credit, 3.
Laboratory fee, $5.00. The Department.
Prerequisite, Zoölogy 26.

75. **I.** 76. **II.** 77. **III.** Special Zoology. — For juniors, seniors, and graduate students. Students are admitted to these courses upon consultation with the department. Studies may be made in one or more of the following fields: synoptic invertebrate zoölogy; synoptic vertebrate zoölogy; comparative vertebrate anatomy; mammalian anatomy (based on the cat); general embryology; vertebrate embryology (based on the chick and pig); genetics. The work given in any year will depend on the demand and other factors; but so far as possible effort will be made to accommodate the student.
3 2-hour laboratory periods, credit, 3.
Laboratory fee, $3.00 per term. The Department.
Prerequisite, Zoölogy 26.

79. **III.** Ornithology. — For juniors; seniors may elect. The taxonomic characters, relationships, adaptive radiation, migration, distribution, and habits of birds, with practical exercises in the museum and studies in the field.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Laboratory fee, $2.00. The Department.
Prerequisite, Zoölogy 26.

GEOLOGY.

Elective Courses.

Each of the courses named below is distinct, so that a student may elect only one, or any two, or all three in any sequence. For those who wish a year's work the desirable sequence is 52. III., 50. I., 51. II. If this sequence is to be followed, 52. III. must be taken as a junior subject; otherwise the courses may all be taken in either the junior or senior year.

50. **I.** Dynamic and Physiographic Geology. — For juniors, seniors, and graduate students. This course deals with geologic processes and especially with the work of various agents in shaping the surfaces of the lands.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professor Gordon.

51. **II.** Historical Geology. — For juniors, seniors, and graduate students. A study of the more important events in the physical history of North America and a review of the plants and animals of the past.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professor Gordon.

52. **III.** Elements of Petrology. — For juniors, seniors, and graduate students. The chemical and physical properties of the principal rock-forming minerals, and the modes of occurrence and structural features of the various kinds of rocks.
1 class hour. 2 2-hour laboratory periods, credit, 3.
Professor Gordon.

DIVISION OF SOCIAL SCIENCES.

Professor Mackimmie.

Agricultural Economics.

Professor Cance, Assistant Professor Yount, Miss Foley, Mr. Smart.

Instruction in agricultural economics is designed to show that the agricultural industry justifies its existence chiefly as a supplier of food and raw textile materials for human consumption; that agricultural success is measured by production of values as well as by production of volume of agricultural products; that the goal of the farmer is the largest net profit over a long-time period; that agricultural production includes all processes from purchase of seed and fertilizer and preparation of seedbed until the product reaches the consumer, including collection, transportation, storage, financing, packing, handling, and selling; that a knowledge of the business of agriculture and agricultural commerce is today more necessary than a knowledge of agricultural technique. The work of this department is conducted by means of lectures, readings, and research in both library and field.

Required Course.

26. **II.** Agriculture and Industry. — For sophomores; juniors and seniors may elect. A course in applied economics. This course should acquaint the student with the variety and magnitude of the agricultural, manufacturing, and other allied industries, their geographic location, economic characteristics, the physical and social reasons for their location and character, their functions, their inter-relations, and their importance in our modern economic life.
3 class hours. Credit, 3.
Professor Cance and Miss Foley.

Elective Courses.

50. **I.** Elements of Agricultural Economics. — For juniors; seniors may elect. This course is designed to follow the course in elements of economics. It deals with the economic principles underlying the welfare and prosperity of the farmer and with those institutions upon which his economic success depends; the economic elements in the production and distribution of agricultural wealth; means of exchange; problems of land tenure and land values; taxation of farm property; and the maintenance of the economic status of the farmer. Lectures, text, readings, topics, and field work.
5 class hours. Credit, 5.
Professor Cance.

51. **III.** The Evolution of Agriculture. — For juniors; seniors may elect. A general survey of the evolution of the agricultural industry. Significant developments are traced and their causes and consequences studied. An attempt is made to give the student a knowledge of the changes which have taken place and which are taking place in the agricultural industry, the conditions which accompany these changes, and to furnish a basis by which the significance and the course of present and future developments in agriculture may be judged Special emphasis will be placed on the development of agriculture in New England and the United States. Lectures, readings, and library work.
5 class hours. Credit, 5
Miss Foley.

52. **II.** Co-operation in Agriculture. — For juniors; seniors may elect. The history, principles, and business relations of agricultural co-operation. (1) A survey of the development, methods, and economic results of farmers' organizations and great co-operative movements; (2) the business organization of agriculture abroad, and the present aspects and tendencies in the United States; (3) the principles underlying successful co-operative endeavor among farmers, and practical working plans for co-operative associations, with particular reference to purchase of supplies and the marketing of perishable products. Lectures, text, assigned readings, and practical exercises.
5 class hours. Credit, 5.
Professor Cance.

53. **III.** The Agricultural Market. — For juniors; seniors and graduate students may elect. A study of the forces and conditions which determine the prices of farm products and the mechanism, methods, and problems concerned with transporting, storing, and distributing them. Supply and demand, course of prices, terminal facilities, the middleman system, speculation in agricultural products, protective legislation, the retail market, and direct sales are taken up. The characteristics and possibilities of the New England market are given special attention. Lectures, readings, assigned studies, and field work. Class trip to Boston or Springfield for market inspection, at an estimated expense of five to ten dollars.
5 class hours. Credit, 5.
Professor Cance.

54. **I.** Economics of Consumption. — For juniors and seniors; graduate students may elect. The purpose of this course is a consideration of the importance of consumption in modern industry and commerce; a classification of consumption wants; a survey of the sources of consumption goods, particularly food. This will be followed by a study of standards of living, the laws of consumption, and a discussion on the administration of income. Finally, a short study will be made of the relation of consumption to the problems of population and to the development of the rural people. Lectures, assigned readings, and practical exercises.
3 class hours. Credit, 3.
Miss Foley.

75. **II.** Rural and Business Law. — For seniors; juniors may elect. Land, titles, public roads, rights incident to ownership of live stock, contracts, commercial paper, and distinctions between personal and real property. Text, written exercises, lectures, and class discussions.
5 class hours. Credit, 5.
Mr. Smart.

76. **II.** Transportation of Agricultural Products. — For seniors and graduate students; juniors may elect. The development of highway, waterway, and railway transportation, and its relation to the agricultural and industrial development of the country; the principles governing the operation and control of transportation agencies; present-day problems relating to the shipment of farm products, rates, facilities, and services; methods of reducing wastes in transportation; the economics of the good roads movement and of motor transportation. Lectures, text, and field work.
5 class hours. Credit, 5.
Professor Cance.

77. **I.** Problems in Agricultural Economics. — For seniors and graduate students; juniors may elect. An advanced course for those desirous of studying more intensively some of the economic problems affecting the farmer and the production and distribution of the food supply. Current economic questions, agricultural legislation, government aids and subsidies, and causes affecting land valuations are some of the problems discussed. Particular attention will be

given to economic problems relating to New England and to agricultural commerce. Students will be encouraged to pursue lines of individual interest.
5 class hours. Credit, 5.
Professor Cance.

78. **III.** Agricultural Credit and Finance. — For seniors; juniors may elect. Lectures, discussions, and assigned readings. The legitimate use of credit in agriculture and its industry; the production, storage, and marketing of agricultural products; the development, organization, and methods of operation of agricultural credit institutions; the methods by which the individual may increase his credit standing and borrowing power; ways in which the present credit facilities may be increased.
3 class hours. Credit, 3.
Assistant Professor Yount.

79. **I.** Principles and Methods of Statistics. — For seniors; juniors and graduate students may elect. Methods of collecting, analyzing, interpreting, and presenting statistical information. The application of statistical methods to the fields of agriculture, economics, education, business, and industry is emphasized through practical laboratory problems.
2 class hours. 3 2-hour laboratory periods, credit, 5.
Assistant Professor Yount.

80. **I.** 81. **II.** 82. **III.** Seminar. — For seniors and graduate students. Research in agricultural economics and history; problems of New England agriculture. Library work and reports. If desirable some other topic may be substituted.
1 or 2 2-hour conference periods, credit, 1 or 2.
The Department.

83. **I.** Salesmanship of Agricultural Products. — For seniors; juniors may elect. The course embraces a study of the principles and practices that are involved in the selling of goods and services. The application of these principles of salesmanship to the disposal of agricultural products is especially emphasized. Types of sales, motives for buying, securing interviews, types of prospects, preparation of sales talks, meeting objections and excuses, and sales demonstrations by students and the instructor are included.
2 class hours. Credit, 2.
Miss Foley.

84. **III.** Advertising Agricultural Products. — For seniors; juniors may elect. A course dealing with the application of the principles of advertising to agricultural products. A study of the nature of advertising, the economics of advertising, the use of media, copy, psychology as applied to advertising layout, the advertising campaign, advertising agency, etc., is made. The solution of practical problems to emphasize different phases of advertising is required of students.
2 class hours. Credit, 2.
Miss Foley.

85. **II.** Advanced Statistics. — For seniors and graduate students. The use of statistics in the analysis of economic data, with special emphasis on prices; the use of multiple correlation methods in price analysis.
3 2-hour laboratory periods, credit, 3.
Assistant Professor Yount.
Prerequisite, Agricultural Economics 79.

86. **III.** Agricultural Prices. — For seniors and graduate students. A study of prices of agricultural products and of other commodities of importance to agriculture.
2 or 3 2-hour laboratory periods, credit, 2 or 3.
Assistant Professor Yount.
Prerequisite, Agricultural Economics 79.

87. **III.** FOREIGN TRADE IN AGRICULTURAL PRODUCTS. — For seniors and graduates; juniors may elect. A general course embracing a study of the principles and practices of international trade and the foreign commerce of the United States, particularly with reference to agricultural products. The development and present status of foreign trade in agricultural products, trade relations with foreign nations, the agencies and practices of foreign trade, foreign-trade salesmanship and advertising, the status of New England with reference to foreign trade are some of the topics which will be presented. The work in the course will also include a personal study of special features of foreign trade and of the trade importance of specific subjects. Textbook, class discussion, and class topics. Class trip to Boston at an estimated expense of twelve to fifteen dollars.

3 class hours. Credit, 3.

Miss FOLEY.

88. **III.** BUSINESS ACCOUNTING. — For seniors; juniors may elect. This course aims to give the student an elementary working knowledge of the principles underlying the accounting system in the gathering, analysis, and interpretation of accounting data, and of the methods used in accounting and preparing the usual types of business statements. The managerial uses of accounting as a means of business control are the keynote of the course.

2 class hours. 3 2-hour laboratory periods, credit, 5.

Admission by permission of the instructor only.

Assistant Professor YOUNT.

Agricultural Education.

Professor WELLES, Professor GLICK, Mr. HEALD.[1]

The primary aim of the department is to train students for service in some form of educational work. The department seeks to be of the greatest possible service to students who are preparing to teach and whose scholastic standing and general qualifications seem to make them suitable candidates for positions. Students desiring state approval as teachers of agriculture or related subjects should confer with the head of the department as early as possible, to insure a desirable range of preparation, including farm experience, a part of which may be gained after entering college. They should also become acquainted with the State Agent for Agricultural Teacher-Training who approves candidates for positions in special schools and departments of agriculture in high schools. A Teacher-Training certificate will be awarded by the Vocational Educational Division to students who qualify as to farm experience, technical subjects, and educational courses as advised. The department recommends to the State Department of Education such graduates of the college as are entitled to receive the high school teachers' term certificate. Students who major in other departments but expect to teach should consult this department regarding the educational courses best suited to their purposes.

Elective Courses.

29. **III.** PROBLEMS IN AMERICAN EDUCATION. — For sophomores; juniors and seniors may elect. The aim of this course is to introduce the student to the field of education through the study of the educational problems in the history of America from the beginning of the Colonial period to the present time. Such an understanding is to be desired in order that the citizens of tomorrow may be able to solve their own educational problems to better advantage.

3 class hours. Credit, 3.

Professor WELLES.

51. **I.** and **II.** PRINCIPLES AND METHODS OF TEACHING. — For juniors; seniors may elect. The course is intended only for those students who expect to become teachers. Others must consult the head of the department before regis-

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[1] State Agent for Agricultural Teacher-Training representing the State Department of Education in the administration of vocational education acts.

tering. The course is based on a good textbook and consists of a study of the general principles of teaching and school management applied to particular "cases" taken from actual experience in public school work. Discussions of the rational solutions of these "cases" tend to fix the ideas in methods. Certain assigned and optional readings, which are both technical and inspirational in character, cover the best that has been printed on the subject of methods of teaching. They are supported by sharp class discussions of the main issues. Observation visits to schools in session are required, with full written reports. Exercises in teaching under supervision are also required, with criticism and discussion of methods and results.
5 class hours. Credit, 5.
Professor WELLES.

52. I. HISTORY AND PHILOSOPHY OF EDUCATION. — For seniors and graduate students; juniors may elect. A general course in the history of educational theory and practice. Special emphasis is placed upon the philosophical background of education.
5 class hours. Credit, 5.
Professor GLICK.

55. I and II. GENERAL PSYCHOLOGY. — For juniors; seniors and graduate students may elect. This is an introductory course for those anticipating further study in psychology, as well as a practical and cultural course for those who can take only one course in this field. It deals with the fundamental principles of psychology and their application to the understanding and control of human thought and action.
5 class hours. Credit, 5.
Professor GLICK.

56. II and III. EDUCATIONAL PSYCHOLOGY. — For juniors; seniors and graduate students may elect. A direct application of psychology to the field of education, and a basic course for both general and specific methods. The course deals with the original nature of the child, the psychology of learning, individual differences, transfer of training, mental tests, etc. Intended primarily for prospective teachers, but open to others who are sufficiently interested.
5 class hours. Credit, 5.
Professor GLICK.
Prerequisite, Agricultural Education 55 or consent of the instructor.

75. III. PRINCIPLES OF SECONDARY EDUCATION. — For seniors; juniors may elect. This is a study of the American high school. It is designed to acquaint the student with the aims of high school education, the characteristics and tendencies of high school students, the high school curriculum, extra-curricular activities, and the best ideas in regard to the administration of high schools.
3 class hours. Credit, 3.
Professor WELLES.

76. I and II. VOCATIONAL AGRICULTURAL TEACHING. — For juniors; seniors and graduate students may elect with permission of the head of the department. The course demands certain prerequisites of experience and objective which make permission necessary. It is the first of the series (76, 78, 82) and gives an introduction to the work of teaching agriculture in secondary schools, with essential information and observation preparatory to apprenticeship before the second term of the senior year.
3 class hours. Credit, 3.
Professor WELLES and VOCATIONAL DIVISION
OF STATE DEPARTMENT OF EDUCATION.

77. III. METHODS IN EXTENSION TEACHING. — For seniors; juniors and others qualified may elect. Candidates must consult the head of the department before registering. The course deals with various phases of extension work and

the methods by which this work is accomplished. The specific lines are those of the county agent, boys' and girls' club leader, county demonstration agent, and agricultural specialist. The different phases of the work will be discussed by members of the Extension staff who are specialists in their particular lines. The course will be offered jointly by the Extension Service and the Department of Agricultural Education.

3 class hours. Credit, 3.

Professor Welles and Extension Service Staff.

78. **I, II,** and **III.** Apprentice Teaching. — For juniors or seniors by arrangement with the head of the department. Under certain conditions a student may be absent from college one term of his junior or senior year for apprentice teaching, depending upon the availability of an apprentice opening, and satisfaction of the other conditions. This is part of the required preparation leading to the Special Certificate for Teachers of Agriculture and is a substitute for Course 80 in these cases. It should be completed before the winter term of the senior year.

Credit, 5.

Professor Welles and Vocational Division
of State Department of Education.

79. **III.** Tests and Measurements. — Limited to fifteen seniors majoring in the department. A study of the development, theory, and construction of the various types of tests and measurements, with special emphasis upon their use in the schools. Practice is given in the administration and scoring of tests. Modern statistical methods are applied to the interpretation of the results.

2 class hours. 1 2-hour conference period, credit, 3.

Professor Glick..

80. **I, II,** and **III.** Supervised Teaching. — For seniors; juniors and others qualified may elect. No student will be admitted to the course without special arrangement with the head of the department. The course includes (*a*) practice teaching, and (*b*) observation. Opportunities for practice teaching are found on the campus and in nearby high schools. A limited amount of study of teaching by observation is permissible. Each student is required to pursue a course of prefessional reading bearing upon the subject he is teaching or observing. The amount of credit depends upon the number, character, and length of teaching or observation exercises and conferences.

Credit, 1 to 5.

The Department.

81. **III.** Seminar in Methods of Teaching. — Open to seniors majoring in agricultural education; graduate students and others by arrangement. This is an opportunity for those definitely intending to teach, to make further studies of methods in special lines other than agriculture, which is provided for in Agricultural Education 76.

1 2-hour conference period, credit, 2.

Professor Welles.

Prerequisites, Agricultural Education 51 and 56, or equivalents.

82. **II.** The Technique of Teaching Agriculture. — For seniors and graduate students by arrangement with the head of the department; juniors in exceptional instances. This course follows Courses 82 and 76. While these are not absolute prerequisites, it will be an exceptional case in which any other order is permitted. The course covers the material, methods, policies, and special requirements of the state for agricultural teaching. It is a thorough putting together of the materials of Courses 76 and 82 and the specific techniques of Course 78.

3 class hours. Credit, 3.

Professor Welles and Vocational Division
of State Department of Education.

83. **III.** Seminar in Applied Psychology. — For seniors and graduate students. Intended for those who desire to study the application of psychology in special fields, such as salesmanship, advertising, medicine, law, public office, extension work, education, business, etc.
1 2-hour conference period, credit, 2.
Professor Glick.
Prerequisites, Agricultural Education 55, and 56 or 85.

85. **I.** Vocational Psychology. — For seniors and graduate students. An application of psychology to the various fields of thought and action other than education.
3 class hours. Credit, 3.
Professor Glick.
Prerequisite, Agricultural Education 55 or consent of the instructor.

95. **II.** Modern Philosophy of Education. — For seniors and graduate students; juniors may elect. A general survey of modern philosophical theories and tendencies with special emphasis upon their influence in determining present educational objectives and procedures. An analysis of the theories underlying various national cultures and ideals, and the significance of education in realizing definite educational objectives.
3 class hours. Credit, 3.
Professor Glick.

Economics, History, and Sociology.

Professor Mackimmie, Assistant Professor Cutler, Miss Foley.

The courses in economics, history, and sociology are planned with the purpose of giving the student that knowledge and understanding of the important factors and problems in this field of study and life which every active citizen and educated man ought to have.

ECONOMICS.

Required Course.

25. **I.** Economic Principles. — For sophomores; juniors and seniors may elect. Definitions of economic terms, such as wealth, capital, value, etc.; factors of production, exchange, and consumption; principles of economic production, supply and demand, diminishing returns, division of labor, productive organization; principles of exchange, theories of value, money and its problems; international trade, tariff and free trade theories; forms of income, wages, interest, rent, profits, and the forces which govern them; principles of spending, economy, luxury; principles and agencies for saving, investments, banks, building associations, insurance. Textbook and readings.
3 class hours. Credit, 3.
Professor Mackimmie.

Elective Courses.

51. **II.** Business and Industry. — For juniors and seniors. The forms, organization, administration, and labor problems of business. Methods of organizing, financing, and administering corporations and partnerships; forms of business administration, wholesaling, jobbing, retailing, advertising, credits and collections; system of industrial remuneration for wage earners, co-operation and preserving industrial peace; problems concerned with protective legislation for workmen and employers, sweated industries, prison labor, child labor, and industrial education.
5 class hours. Credit, 5.
Professor Mackimmie.
Prerequisite, Economics 25.

52. **III.** Public Finance, Taxation, Money and Banking. — For juniors and seniors. Systems and problems of taxation as they are found in Europe and

America; objects for spending public revenue; public debts and methods of organizing them; systems of money and currency problems of America; types, methods, and functions of banks; economic and financial crises and depressions in the United States; modern war finance. Readings and lectures.
5 class hours. Credit, 5.
Professor MACKIMMIE.

Prerequisite, Economics 25.

HISTORY.

Required Course.

30. **III.** AMERICAN HISTORY. — For sophomores; juniors and seniors may elect. The rise and development of the United States, with special stress upon the origin of present conditions. Lectures and readings.
3 class hours. Credit, 3.
Assistant Professor CUTLER.

Elective Courses.

25. **II.** AMERICAN GOVERNMENT. — For sophomores; juniors and seniors may elect. A study of the structure and operation of the machinery of our government; also a study of the history of its development from its inception to the present day.
3 class hours. Credit, 3.
Assistant Professor CUTLER.

28. **I.** ECONOMIC HISTORY OF THE UNITED STATES. — For sophomores; juniors and seniors may elect. A study of the factors and forces which have affected the economic development of the United States. Special attention is focused on the working out of economic principles, and on the inter-action between the economic, social, and political conditions and institutions. Text, lectures, and prepared discussions.
3 class hours. Credit, 3.
Miss FOLEY.

29. **II.** ENGLISH HISTORY. — For sophomores; juniors and seniors may elect. A study of the political, social, and religious movements in England, with special reference to an understanding of English literature.
3 class hours. Credit, 3.
Professor MACKIMMIE.

50. **I.** GOVERNMENT. — For juniors and seniors. Forms and working methods of the government of Great Britain, Germany, France, Russia, Switzerland, New Zealand, and Canada; historic types and theories of government; forms and methods of Federal, State, and local governments in America; progress and problems of democracy, and new reform movements in organization and administration; new tendencies towards social legislation and extension of governmental control.
3 class hours. Credit, 3.
Professor MACKIMMIE.

51. **II.** MODERN EUROPEAN HISTORY. — For juniors and seniors. The modern history of the principal countries of Europe, especially the great movements and revolutions that developed the nations up to the present generation.
3 class hours. Credit, 3.
Professor MACKIMMIE.

52. **III.** EUROPEAN HISTORY SINCE 1870. — For juniors and seniors. The Franco-Prussian War and the formation of the German Empire, the unification of Italy, the Third French Republic, European expansion in the East, the Russo-Japanese War, and the origin, events, and results of the War of 1914. While

a continuation of Course 51, this course will be complete in itself and may be elected by those who have had no history training. Its aim is to provide the basis for an understanding of present-day conditions and for an intelligent participation in world affairs.

3 class hours. Credit, 3.

Professor MACKIMMIE.

SOCIOLOGY.

Elective Courses.

27. **I.** ELEMENTS OF RURAL SOCIOLOGY. — For sophomores. Social psychology; a broad survey of the field of rural sociology, including such topics as the origin of rural sociology, its methods and problems; relation of sociological to other aspects of agricultural problems; religious, educational, and social ideals of rural people; characteristics and influence of the rural environment; rural institutions — the school, the church, local government — and the effects of modern conditions of life on them; rural organization; problems of progress, an analysis of the needs of rural life in its further development. Lectures, readings, and essays on assigned topics.

3 class hours. Credit, 3.

Assistant Professor CUTLER.

50. **I.** 51. **II.** 52. **III.** SOCIOLOGICAL LAWS AND THEIR APPLICATION. — For juniors; seniors may elect. A study of the scientific principles which characterize human collective behavior and determine the relation of the individual to his various groups — the family, the school, the club, recreational institutions, the church, business, the government, and others. This study is especially directed toward rural phases of the subject. Lectures, readings, field work, discussions, and topical reports. These courses are sequential but may be elected independently.

3 class hours. Credit, 3.

Assistant Professor CUTLER.

54. **II.** CIVILIZATIONS, ANCIENT AND MODERN. — For sophomores; juniors and seniors may elect. Social history and anthropology; the evolutionary origin and history of man; characteristics of primitive man, departure from the animal status and beginnings of civilization; origin and development of industries, arts, and sciences; the evolution of languages, warfare, migrations, and social institutions; a study of the powerful natural and human forces that have brought man from the early stages to modern development; characteristic features of the leading civilizations and races of ancient and modern times; beneficial and dangerous factors in American life in view of the history of human civilization.

5 class hours. Credit, 5.

Assistant Professor CUTLER.

75. **I.** SOCIAL INSTITUTIONS AND SOCIAL REFORMS. — For seniors; juniors by permission. Social institutions, such as the family, the State, property, religions; and such current problems as eugenics, race suicide, divorce, crime and delinquent classes, prison reform, prevention and treatment of dependents and defectives, poverty, its causes and preventions; constructive modern social reform movements for insurance of wage earners, protection of childhood, assurance of safety, health, and play time for all classes. The correctional and charitable institutions of Massachusetts are studied in considerable detail.

5 class hours. Credit, 5.

Assistant Professor CUTLER.

76. **I.** FIELD WORK IN RURAL SOCIOLOGY. — For seniors; juniors may elect. Designed to meet the needs of students who wish to do some constructive work in rural social service while still in college. The work is carried on in co-operation with the various college agencies engaged in rural service. Any project for which

credit in this course is to be asked must first have the approval of the head of the department.

2 to 6 laboratory hours, credit, 1 to 3.
Assistant Professor Cutler.

Prerequisites, Rural Sociology 27, or 50, 51, and 52.

77. **III.** Rural Social Research and Surveys. — For seniors; juniors may elect. Research methods — measurements, exploration, criticism, surveys; observation, comparison, and correlation; a careful study of the scientific method as applied to social problems; the technique of investigation and research; the procedure of gathering sociological data by means of the survey; the interpretation and graphic presentation of statistical facts. Text, lectures, field and laboratory work.

3 class hours. Credit, 3.
Assistant Professor Cutler.

79. **I.** 80. **II.** 81. **III.** Seminar. — Enrolment is open to graduate students, seniors majoring in rural social science, and others especially prepared. Topics recently studied are: sociology of American colonies in the Caribbean region; success in rural leadership; rural sociology of the Old World and Far East; the standard of living in American rural life; proposed improvements in rural local government; international agricultural problems. Courses are sequential but may be elected independently.

2 class hours. Credit, 2.
Assistant Professor Cutler.

Languages and Literatures.

Professor Patterson, Professor Julian, Associate Professor Prince, Associate Professor Rand, Assistant Professor Dunbar, Assistant Professor Goding, Mr. Durkee, Mr. Anderson, Mr. Goldberg.

The courses in English are intended to enable students to express themselves effectively and to appreciate the ideals of English-speaking people throughout their history.

The aim of the courses in French, Spanish, and German is to give the student a practical knowledge of these languages for the purpose of wider reading and research, to introduce him to some of their treasures in art and science, and through the literature to acquaint him with the people.

The courses in History and Interpretation of Music are non-technical in treatment and are intended for those who wish a background of the history of music and its interpretation.

ENGLISH.

Required Courses.

1. **I.** 2. **II.** 3. **III.** English. — For freshmen. Composition. Intended to teach straight thinking, sound structure, clear and correct expression. Lectures, recitations, theme writing, and conferences.

3 class hours. Credit, 3.
Professors Patterson, Prince, Rand, Mr. Anderson, and Mr. Goldberg.

25. **I.** 26. **II.** 27. **III.** English. — For sophomores. A general reading course in English literature.

2 class hours. Credit, 2.
Professor Patterson.

28. **I.** 29. **II.** 30. **III.** English. — For sophomores. Public speaking.

1 class hour. Credit, 1.
Associate Professors Prince and Rand, Mr. Anderson, and Mr. Goldberg.

Elective Courses.

50. **I.** English Poetry of the Romantic Period (1929–30). — Alternates with Course 53. For juniors; seniors may elect. A course in history, appre-

ciation, and understanding. Some of the writers studied are Gray, Goldsmith, Burns, Wordsworth, Byron.
3 class hours. Credit, 3.
Professor PATTERSON.

51. **II.** ENGLISH POETRY IN THE NINETEENTH CENTURY (1928–29). — Alternates with Course 54. For juniors; seniors may elect. Some of the writers studied are Tennyson, Arnold, Clough.
3 class hours. Credit, 3.
Professor PATTERSON.

57. **III.** ENGLISH POETRY IN THE NINETEENTH CENTURY (1928–29). — Alternates with Course 58. For juniors; seniors may elect. Browning, the Pre-Raphaelites.
3 class hours. Credit, 3.
Professor PATTERSON.

52. **III.** ENGLISH WRITERS FROM MILTON TO POPE. — For juniors; seniors may elect. Some of the writers studied are Milton, Bunyan, Dryden, Pope.
3 class hours. Credit, 3.
Professor PATTERSON.

53. **I.** ENGLISH PROSE OF THE EIGHTEENTH CENTURY (1928–29). — For juniors; seniors may elect. A brief exposition of the thinking of the period in philosophy, government, and criticism is followed by a study of essayists and letter writers from Defoe to Goldsmith.
3 class hours. Credit, 3.
Professor PATTERSON.

54. **II.** ENGLISH PROSE OF THE NINETEENTH CENTURY (1929–30). — For juniors; seniors may elect. Among the writers considered are Coleridge, DeQuincey, Macaulay, Lamb, Hazlitt.
3 class hours. Credit, 3.
Professor PATTERSON.

58. **III.** ENGLISH PROSE OF THE NINETEENTH CENTURY (1929–30). — For juniors; seniors may elect. Among the writers considered are Carlyle, Ruskin, Newman, Arnold, Pater.
3 class hours. Credit, 3.
Mr. ANDERSON.

55. **II.** AMERICAN LITERATURE. — For juniors; seniors may elect. A course in the chief American prose writers, among those studied being Franklin, Brockden Brown, Irving, Cooper, Poe, Hawthorne, Emerson, Thoreau, Lowell, Holmes, Parkman.
3 class hours. Credit, 3.
Associate Professor PRINCE.

56. **III.** AMERICAN LITERATURE. — For juniors; seniors may elect. A course in the chief American poets, among those studied being Freneau, Bryant, Poe, Emerson, Longfellow, Whittier, Holmes, Lowell, Whitman, Lanier.
3 class hours. Credit, 3.
Associate Professor PRINCE.

60. **I.** THE LITERATURE OF RURAL LIFE. — For juniors; seniors may elect. A critical and appreciative study of writers, both in prose and poetry, who have interpreted nature from the viewpoint of the lover of country life. Not given 1928–29.
3 class hours. Credit, 3.

61. **II.** The Literature of Rural Life. — For juniors; seniors may elect. As announced under Course 60. Given 1928–29.
3 class hours. Credit, 3.
Associate Professor Prince.

65. **I.** Advanced Composition. — For juniors; seniors may elect. Advanced work in expository writing, based upon specimens by contemporary authors and upon the personal experience of the student. Particular attention is given to organization, diction, and style.
3 class hours. Credit, 3.
Associate Professor Rand.

66. **II.** Advanced Composition. — For juniors; seniors may elect. The preparation of theses and similar manuscripts upon subjects selected by the student. The foundation of this course lies in an orderly accumulation of material followed by an intelligent and readable interpretation of its significance.
3 class hours. Credit, 3.
Associate Professor Rand.

67. **III.** Advanced Composition. — For juniors; seniors may elect. Work in journalistic and fictional narrative with supplementary reading.
3 class hours. Credit, 3.
Associate Professor Rand.

75. **III.** Prose Fiction. — The short story or the novel. For seniors; juniors may elect. Readings, reports, and discussions.
3 class hours. Credit, 3.
Professor Patterson.

79. **II.** Shakespeare. — For seniors; juniors may elect. A cursory survey of the origin and rise of English drama is followed by the reading of about fifteen of Shakespeare's plays, selected to indicate the evolution of the dramatist and to emphasize the various phases of his art. Every attempt is made to deepen the student's appreciation of the personalities to be found in the plays, and of the beauty of the many memorable poetic passages.
3 class hours. Credit, 3.
Associate Professor Rand.

80. **III.** Modern Drama (1928–29). — For seniors; juniors may elect. This course traces the development of English drama from the time of the Restoration to the present day. The purpose of the course is to impart an intelligent and sympathetic interest in the theatre of the Twentieth Century.
3 class hours. Credit, 3.
Associate Professor Rand.

81. **III.** Modern Poetry (1929–30). — For seniors; juniors may elect. A study of the modern spirit in poetry, tracing its influence from its introduction in America by Whitman and Emily Dickinson and in England by Kipling and Masefield, to the present time. Alternates with Course 80.
3 class hours. Credit, 3.
Associate Professor Rand.

Public Speaking.

Elective Courses.

50. **I.** Argumentation. — For juniors; seniors may elect. Presents the fundamental principles of argumentation as applied to oral and written discourse, and develops in the student power to handle argument convincingly and

persuasively. Lectures, discussions of leading questions of the day, practice in brief-drawing and the writing of forensics. The course is recommended for those who desire to enter the intercollegiate debates.
3 class hours. Credit, 3.
Associate Professor PRINCE.

51. **III.** OCCASIONAL ORATORY.—For juniors; seniors may elect. A study of the principles and the practice of formal oratory; the preparation and delivery of one original oration; prescribed reading in oratory. The course is recommended for those who wish to enter the Flint Contest.
3 class hours. Credit, 3.
Associate Professor PRINCE.

52. **I.** EXTEMPORE SPEAKING.—For juniors; seniors may elect. The course is intended to give the student practice in thinking upon his feet and in presenting cogently his thinking to a public group.
3 class hours. Credit, 3.
Associate Professor PRINCE.

FRENCH.

Elective Courses.

1. **I.** 2. **II.** 3. **III.** ELEMENTARY FRENCH.—Required of freshmen who do not elect German and who have not presented French for entrance; sophomores, juniors, and seniors may elect. The essentials of grammar are rapidly taught and will be accompanied by as much reading as possible.
3 class hours. Credit, 3.
Assistant Professor GODING.

4. **I.** 5. **II.** 6. **III.** INTERMEDIATE FRENCH.—Required of freshmen who present two years of French for entrance and who do not elect German; sophomores, juniors, and seniors may elect. Training for rapid reading. The reading of a number of short stories, novels, and plays; composition, reports on collateral reading from periodicals and scientific texts in the library.
3 class hours. Credit, 3.
Assistant Professors DUNBAR and GODING.
Prerequisites, French 1, 2, and 3, or Entrance French.

25. **I.** 26. **II.** 27. **III.** INTERMEDIATE FRENCH.—For sophomores; juniors and seniors may elect. Training for rapid reading. The reading of a number of short stories, novels, and plays; readings from periodicals and scientific texts in the library.
3 class hours. Credit, 3.
Assistant Professor DUNBAR.
Prerequisites, French 1, 2, and 3.

28. **I.** 29. **II.** 30. **III.** ADVANCED FRENCH.—For sophomores; juniors and seniors may elect. A general survey of the history of French literature and the development of French culture, with representative works of the important periods. Lectures. Outside readings.
3 class hours. Credit, 3.
Assistant Professor GODING.
Prerequisites, French 4, 5, and 6, or 25, 26, and 27.

50. **I.** FRENCH LITERATURE.—For juniors; seniors may elect. A detailed study of the Romantic period. Readings from Hugo, de Vigny, Lamartine, de Musset, and others. Influence of English, German, and Italian literature is stressed. Lectures and outside readings.
3 class hours. Credit, 3.
Assistant Professor GODING.
Prerequisites, French 4, 5, and 6, or 25, 26, and 27.

51. **II.** FRENCH LITERATURE. — For juniors; seniors may elect. A detailed study of the Realistic period. Readings from Balzac, Flaubert, Stendhal, and others. Lectures, outside readings.
3 class hours. Credit, 3.
Assistant Professor GODING.
Prerequisites, French 4, 5, and 6, or 25, 26, and 27.

52. **III.** FRENCH LITERATURE. — For juniors; seniors may elect. Later nineteenth century and modern French literature. Readings from Rostand, Loti, Daudet, Anatole France, and others. Discussions of contemporary authors. Modern criticism.
3 class hours. Credit, 3.
Assistant Professor GODING.
Prerequisites, French 4, 5, and 6, or 25, 26, and 27.

75. **I.** 76. **II.** 77. **III.** FRENCH LITERATURE. — For seniors; juniors may elect. Survey of the Classical period, with readings from representative works.
2 class hours. Credit, 2.
Assistant Professor DUNBAR.
Prerequisites, French 4, 5, and 6, or 25, 26, and 27.

SPANISH.

Elective Courses.

50. **I.** 51. **II.** 52. **III.** ELEMENTARY SPANISH. — For juniors; seniors may elect. Open to other students upon arrangement. Grammar, exercises in composition and conversation, reading of selected short stories.
3 class hours. Credit, 3.
Assistant Professor DUNBAR.

75. **I.** 76. **II.** 77. **III.** MODERN SPANISH AUTHORS. — For seniors. Reading from modern Spanish novel and drama; composition; outside reading.
2 class hours. Credit, 2.
Assistant Professor DUNBAR.
Prerequisite, Spanish 52.

MUSIC.

Elective Courses.

50. **I.** HISTORY AND INTERPRETATION OF MUSIC. — For juniors; seniors may elect. The Classical School. Works of Bach, Handel, Haydn, and Mozart are performed and studied. Lectures, musical illustrations, and outside readings.
2 scheduled hours. Credit, 1.
Laboratory fee, $1.50. Assistant Professor GODING.

51. **II.** HISTORY AND INTERPRETATION OF MUSIC. — For juniors; seniors may elect. A continuation of Course 50. The Romantic School — Beethoven, Schubert, Weber, Mendelssohn, Schumann, Chopin, Berlioz, Liszt.
2 scheduled hours. Credit, 1.
Laboratory fee, $1.50. Assistant Professor GODING.

52. **III.** HISTORY AND INTERPRETATION OF MUSIC. — For juniors; seniors may elect. The Italian, French, and German schools of opera; modern and contemporary composers.
2 scheduled hours. Credit, 1.
Laboratory fee, $1.50. Assistant Professor GODING.

75. **I.** 76. **II.** 77. **III.** ENSEMBLE MUSIC. — For juniors and seniors. The purpose of this course is to train students of average ability to play ensemble music. Group technique will be stressed. Persons with fundamental

knowledge of, or some training on, any instrument should profit by the laboratory practice. The nature of the practice work will be determined by the instruments available but it is hoped that a full orchestra can be regularly maintained. Smaller combinations such as ensembles of any sort, will be fostered when at all possible. Concerts of a semi-public nature will be given by the members of the course. Lectures, laboratory practice.
3 scheduled hours. Credit, 2.
Laboratory fee, $1.50 per term. Assistant Professors GODING and CUBBON.

GERMAN.

Elective Courses.

1. **I.** 2. **II.** 3. **III.** ELEMENTARY GERMAN. — Required of freshmen who do not elect French and who have not presented German for entrance; sophomores, juniors and seniors may elect. Grammar, reading, and prose composition. Special emphasis is placed on the acquirement of a fundamental stem vocabulary and the ability to understand simple German paragraphs in German.
3 class hours. Credit, 3.
Professor JULIAN and Mr. DURKEE.

4. **I.** 5. **II.** 6. **III.** INTERMEDIATE GERMAN. — Required of freshmen who present two years of German for entrance and who do not elect French; sophomores, juniors, and seniors may elect. Shorter stories of Baumbach, Gerstäcker, Heyse, Keller, Wildenbruch; selected works of Schiller; grammar review and advanced prose composition.
3 class hours. Credit, 3.
Mr. DURKEE.

Prerequisites, German 1, 2, and 3, or Entrance German.

25. **I.** 26. **II.** 27. **III.** INTERMEDIATE GERMAN. — For sophomores; juniors and seniors may elect. The German short story; grammar review and advanced prose composition.
3 class hours. Credit, 3.
Professor JULIAN.

Prerequisites, German 1, 2, and 3.

28. **I.** 29. **II.** 30. **III.** ADVANCED GERMAN. — For sophomores; juniors and seniors may elect. Reading and study of the most important literary productions in the field of the novel and the drama.
3 class hours. Credit, 3.
Professor JULIAN.

Prerequisites, German 4, 5, and 6, or 25, 26, and 27.

50. **I.** 51. **II.** 52. **III.** SCIENTIFIC GERMAN. — For juniors and seniors. Intensive and specialized reading of literature in standard German scientific journals and reference books.
3 class hours. Credit, 3.
Professor JULIAN.

Prerequisites, German 4, 5, and 6, or 25, 26, and 27.

75. **I.** 76. **II.** 77. **III.** GERMAN LITERATURE. — For seniors. Advanced language and literary study, conducted entirely in German. Lectures on German literature and history; collateral readings, including masterpieces of different epochs, such as *Niebelungenlied,* Goethe's *Faust,* and a typical modern drama.
3 class hours. Credit, 3.
Professor JULIAN.

Prerequisites, German 28, 29, and 30.

GENERAL DEPARTMENTS.

Military Science and Tactics.

Major N. Butler Briscoe. Cav. (D. O. L.), U. S. A.; Major Eustis L. Hubbard, Cav. (D. O. L.), U. S. A.; Captain Edwin M. Sumner, Cav. (D. O. L.), U. S. A.; Technical Sergeant John J. Lee, U. S. A., Retired; Technical Sergeant James A. Warren, Cav. (D. E. M. L.), U. S. A.; and a detachment of enlisted men of the United States Army.

Under act of Congress, July 2, 1862, the College was required to provide a two-year course in military instruction under a regular army officer. All able-bodied four-year male students are required to take this course. Under act of Congress, June 3, 1916, as amended by act of Congress, September 8, 1916, there was established at this college in April, 1917, an infantry unit of the Reserve Officers' Training Corps. Following the World War and an act of Congress, July 9, 1918, the Reserve Officers' Training Corps has been in operation under the regulation of the War Department, administered by the president of the college and the professor of military science and tactics. Beginning with the fall term, 1920–21, the infantry unit of the Reserve Officers' Training Corps was converted into a cavalry unit.

The primary object of the Reserve Officers' Training Corps is to provide systematic military training at civil educational institutions, for the ultimate purpose of qualifying selected students of such institutions as reserve officers in the military forces of the United States. It is intended to attain this object during the time the students are pursuing their general or professional studies, with the least practicable interference with their civil careers, by employing methods designed to fit men physically, mentally, and morally for pursuits of peace as well as war.

The course for cavalry units of the Reserve Officers' Training Corps includes theoretical and practical instruction in all phases of cavalry work, so distributed over the four-year college course as to qualify students at the end of the freshman year as privates of cavalry, at the end of the sophomore year as non-commissioned officers of cavalry, and upon graduation as reserve officers. The instruction in this department covers cavalry drill, cavalry weapons — rifle, pistol, saber, automatic rifle, and machine gun — map reading and military sketching, minor tactics, equitation, etc. The course in equitation includes cross-country riding and instruction in polo. So far as season and weather permit, instruction is of a practical nature, out of doors.

All male candidates for a degree in the four-year course must take at least three hours a week of military training for two years. Students who are approved by the president and the professor of military science and tactics may take the advanced course in their junior and senior years if they so elect. The advanced course consists of at least five hours per week and a summer camp of about six weeks during the summer vacation between the junior and senior years. Students taking this course are paid by the Federal Government at a rate to be fixed by the Secretary of War, not to exceed the value of the army ration. The rate now fixed is thirty cents per day, which with all allowances amounts to about two hundred and thirty-five dollars. Students graduating in the advanced course are eligible for commissions in the Officers' Reserve Corps, but are not required to accept such commissions if offered.

The uniform furnished to the freshmen and sophomores (basic course) is of olive drab woolen cloth, and is supplied by the Federal Government without cost except for the necessary alterations. The uniforms for the juniors and seniors (advanced course) are of forest green woolen cloth, tailor-made for the individual student. A deposit of thirty dollars for this uniform is required at the beginning of the junior year. The student is reimbursed through the allowances for clothing and rations.

Required Courses.

1. **I.** 2. **II.** 3. **III.** For freshmen. Theoretical and practical instruction in courtesy and discipline, riding, and drills, rifle marksmanship, cavalry equipment and arms, physical training, history, dismounted sports.

3 scheduled hours, credit, 2.
Professor Briscoe and Assistants.

25. **I.** 26. **II.** 27. **III.** For sophomores. Theoretical and practical instruction in leadership, map reading and map making, hygiene, sanitation, and first aid, cavalry equipment and arms, pistol markmanship, riding and drill, mounted sports.

3 scheduled hours, credit, 2.
Professor Briscoe and Assistants.

Elective Courses.

50. **I.** 51. **II.** 52. **III.** For juniors. Cavalry drill and riding, leadership and command, engineering (bridges, explosives), cavalry equipment and arms, selection and care of horses and mules, communications (telephone, telegraph, radio), mounted sports, jumping, polo.

5 scheduled hours, credit, 4.
Professor Briscoe and Assistants.

75. **I.** 76. **II.** 77. **III.** For seniors. Transportation (wagon and pack), correspondence and records, law, leadership and command, drill and riding, history, mounted sports, competitions, horse-show preparation and management, polo, cross-country riding.

5 scheduled hours, credit, 4.
Professor Briscoe and Assistants.

Physical Education and Hygiene.

Professor Hicks, Professor Gore, Mrs. Hicks, Assistant Professor Derby, Mr. Ball, Mr. Briggs, Mr. McGeoch.

The purpose of the laboratory courses offered by this department is to provide active exercise regularly, in order that all students may properly care for their health and maintain their physical condition throughout their college course. It is also hoped that the health and exercise habits thus established will be continued after leaving college. The course in Hygiene for men is a series of lectures designed to give to the new student the simple rules of living both as an individual and in his relations with others. The required courses for men and for women are supplemented by special lectures on social hygiene and social relations. The elective courses for men are designed for those students who intend to teach in the secondary schools and who may be called upon for administrative work or coaching in connection with school physical education programs.

[All undergraduate male students are given a physical examination upon entering. All undergraduate women students are required to present as a part of their entrance record, a form report of a physical examination by their family physician.]

MEN.

Required Courses.

1. **I.** Hygiene. — For freshmen. Lectures on personal hygiene.
1 class hour. Credit, 1.
Professor Hicks.

2. **I.** Recreation. — For freshmen. Outdoor games.
2 laboratory hours, credit, 1.
The Department.

3. **III.** Recreation. — For freshmen. Outdoor games.
2 laboratory hours, credit, 1.
The Department.

7. **I.** 8. **II.** 9. **III.** Recreation. — Military substitute for freshman men.
3 scheduled hours, credit, 2.
The Department.

25. **I.** Recreation. — For sophomores. Outdoor games.
2 laboratory hours, credit, 1.
The Department.

26. **III.** Recreation. — For sophomores. Outdoor games.
2 laboratory hours, credit, 1.
The Department.

30. **I.** 31. **II.** 32. **III.** Recreation. — Military substitute for sophomore men.
3 scheduled hours, credit, 2.
The Department.

Elective Courses.

77. **II.** History and Purposes of Physical Education. — For seniors. Ideals and aims of physical education, supervision of athletics, and physical education administration.
2 class hours. Credit, 2.
Professor Hicks.

78. **III.** Outline Course for Teacher-Coaches. — For seniors. Election by permission only. This course outlines the coaching of the major sports, coaching fundamentals, training and first aid, coaching psychology, secondary school health education, and school programs of physical education. Lectures, collateral readings, theory situations, normal practice, and notebook.
2 class hours. Credit, 2.
The Department.

WOMEN.

Required Courses.

4. **I.** Recreation. — For freshmen. Outdoor games.
3 scheduled hours, credit, 2.
Mrs. Hicks.

5. **II.** Gymnastics. — For freshmen. Body mechanics, folk and national dancing, gymnastics.
3 scheduled hours, credit, 2.
Mrs. Hicks.

6. **III.** Recreation. — For freshmen. Outdoor games.
2 scheduled hours, credit, 1.
Mrs. Hicks.

27. **I.** Recreation. — For sophomores. Outdoor games.
5 scheduled hours, credit, 3.
Mrs. Hicks.

28. **II.** Gymnastics. — For sophomores. Body mechanics, folk and national dancing, gymnastics, rhythms, games.
3 scheduled hours, credit, 2.
Mrs. Hicks.

29. **III.** Recreation. — For sophomores. Outdoor games.
5 scheduled hours, credit, 3.
Mrs. Hicks.

Elective Courses.

50. **II.** Rhythms. — For juniors. Rhythmic dancing, clog dancing.
3 scheduled hours, credit, 2.
Mrs. Hicks.

76. **II.** Rhythms. — For seniors. Rhythmic dancing, clog dancing.
3 scheduled hours, credit, 2.
Mrs. Hicks.

The Graduate School.

Roscoe W. Thatcher, D.Agr., LL.D., President of the College.

Henry T. Fernald, Ph.D., Director of the Graduate School: Professor of Entomology.

Graduate Staff, 1928–1929.

President Thatcher, Director Fernald, Dean Machmer, Heads of Divisions, Heads of Departments offering graduate courses, Professors and Assistant Professors teaching graduate subjects; R. D. Hawley, Secretary.

General Statements.

Graduate courses leading to the degrees master of science, master of landscape architecture, master of agriculture, doctor of agriculture, and doctor of philosophy have been available at the college for more than twenty years, and the graduate school work has been in great demand. Graduate students desiring advanced courses, but who do not wish to take advanced degrees, are also admitted.

Admission.

Admission to the graduate school will be granted: —

1. To graduates of the Massachusetts Agricultural College.
2. To graduates of other institutions of good standing, who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of accepted standing, but has not taken as much of the subject he desires to select for his major study as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work in that department as the head of the department may consider necessary, without credit toward his advanced degree. In the case of minor subjects for advanced degrees, credit begins to accrue from the point where the previous training of the applicant ended, whether it be graduate or undergraduate in its rating at this college, subject however to such limitations as may be fixed by the department concerned. (See department statements.)

Applications for membership in the graduate school should be presented to the director of the school. An official transcript of the applicant's collegiate record, and a statement of the graduate work desired and whether the applicant intends to study for a degree should be submitted.

Registration as a graduate student should be promptly made at the director's office and must be renewed for each term thereafter.

The Graduate Work.

Candidates for the degree of doctor of philosophy are required to prosecute three subjects, one of which shall be designated as the major and the others as minors. No two of these subjects may be taken in the same department. An original thesis shall be considered a part of the major subject.

Candidates for the degree of doctor of agriculture are required to select a major and such other subjects as will develop the major in its greatest intensity and comprehensiveness. Successful experience is also requisite, together with a thesis which represents a masterly survey or intimate study through accurate application of some phase of the major subject.

Candidates for the degree of master of science are required to prosecute two subjects, one of which shall be designated as a major and the other as a minor.

When desirable, and approved by the director, the minor may be made up of subjects from more than one department. The major and minor subjects may not be selected in the same department. An original thesis is considered a part of the major subject.

Candidates for the degree of master of agriculture are allowed greater privileges in the selection of subjects, but will be required to select a major and such other supporting lines of study as will be necessary to equip the individual professionally. A thesis which will reveal the professional training of the individual will be required.

Candidates for the degree of master of landscape architecture will be expected to conform to the established courses of the department, and to the requirements of the department in the preparation of a thesis, as well as in actual experience outside the college.

Candidates for membership in the graduate school who do not desire to work for a degree may, with the approval of the director of the school, take more than one subject in the same department, or pursue work in several departments, if their preparation will permit. A statement of the subjects chosen must in each case be submitted to the director of the graduate school for approval. The chosen subjects must bear an appropriate relation to each other.

A working knowledge of French and German is important for successful graduate work in practically all the major lines offered by the college, and students not having this will be given an opportunity to acquire it along with their graduate work..

The graduate staff reserves the privilege of recommending and allowing courses in other institutions as a part of the work for advanced degrees at this college, whenever such a policy seems advisable. A certain amount of work in absentia may also be permitted, provided it is prosecuted under satisfactory direction and supervision, and regular and sufficient reports of progress are submitted.

THESIS.

A thesis is required of each candidate for an advanced degree. It must be on a topic belonging to the candidate's major subject, must show that its writer possesses the ability to carry on constructive study, must be an actual contribution to knowledge, and possess real merit.

The thesis in its final form must be submitted to the director by May 15 of the year in which the student is to present himself for the advanced degree, and before he may take the required examination. Three complete copies are required. One of the copies is to be retained as an official copy by the director, one is to be deposited in the college library, and the third is to be retained by the department in which the thesis was prepared. The candidate for the doctor's degree must be prepared to defend at the oral examination the views presented in his thesis.

FINAL EXAMINATIONS.

For the degree of doctor of philosophy or doctor of agriculture, final examinations on the minors taken are given upon the completion of the subjects. In the major subject, a written examination, if successfully passed, is followed by an oral examination in the presence of the graduate staff.

For the degree of master of science, master of agriculture, or master of landscape architecture, a final examination upon the minor taken is given upon the completion of each course, and in the major a final examination, which may be either written or oral, or both, is given over all the work by the department concerned.

DEGREES CONFERRED.

The degrees of doctor of philosophy and doctor of agriculture are conferred upon graduate students who have met the following requirements: —

1. The devotion of at least three years[1] to the prosecution of three subjects of study and research in residence at the college.
2. The earning of not less than one hundred credits in the chief or major subject, and of not less than twenty-five credits in each of two minor subjects.

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[1] All time statements refer to minimum time.

3. The preparation of a thesis, in the major subject, constituting an actual contribution to knowledge and accompanied by drawings if necessary. For the degree of doctor of agriculture the thesis may be modified to meet professional requirements.

4. The passing of final examinations, in both the major and minor subjects, to the satisfaction of the instructors in charge.

5. A public oral examination.

6. The payment of all fees and college expenses required.

The degrees of master of science, master of agriculture, and master of landscape architecture are conferred upon graduate students who have met the following requirements: —

1. The devotion of at least one year and a half to the prosecution of study in two subjects of study and research, not less than one full college year of which must be in residence. In the case of a master of landscape architecture the student must follow the prescribed course of study.

2. The earning of not less than fifty credits in the chief or major subject, and of not less than twenty-five credits in the minor subject. Students pursuing the course in landscape architecture will devote all of their time to the established course, and meet the conditions of one year of experience outside the college.

3. The preparation of a thesis in the major subject, constituting an actual contribution to knowledge, and accompanied by drawings if necessary.

4. The passing of final examinations, in both major and minor subjects, to the satisfaction of the professors in charge.

5. The payment of all fees and college expenses required.

The fee for the degree of master of science, master of agriculture, or master of landscape architecture is $10, and for the degree of doctor of agriculture, or doctor of philosophy, $25.

COURSES OFFERED.

Courses available as major subjects for the degree of doctor of philosophy: —

Agricultural Economics.
Agronomy.
Bacteriology and Physiology.
Botany.
Chemistry.
Entomology.
Horticulture.
Pomology.
Rural Sociology.

Courses available as major subjects for the degree of master of science: —

Agricultural Economics.
Agricultural Education.
Agronomy.
Animal Husbandry.
Bacteriology and Physiology.
Botany.
Chemistry.
Dairy Husbandry.
Entomology.
Horticulture.
Pomology.
Poultry Science.
Rural Sociology.

Courses available as major subjects for the degree of master of agriculture: —

Agronomy.
Animal Husbandry.
Poultry Science.

The course in landscape architecture leads to the degree of master of landscape architecture.

Courses available as minor subjects: —

Agricultural Economics.
Agricultural Education.
Agronomy.
Animal Husbandry.
Bacteriology and Physiology.
Botany.
Chemistry.
Dairy Husbandry.
Entomology.
Horticulture.
Landscape Architecture.
Mathematics and Physics.
Pomology.
Poultry Science.
Rural Sociology.
Veterinary Science.
Zoölogy.

General Outline of Courses for Advanced Degrees.

Agricultural Economics.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must have had the following courses or their equivalent: Economics 25, Agricultural Economics 26 and 50.

REQUIRED WORK. — Candidates must take the following courses: Agricultural Economics 51, 52, 53, and 79. These courses, specially arranged for graduates, may be taken as Courses 120, 170, 155, and 180 for graduate credit. In addition, candidates must take Courses 110, 111, 130, 165, and 175 in agricultural economics; Sociology 27 and 50, or equivalent courses; and Economics 51 and 52, or equivalent courses.

Each candidate will be required to have a working knowledge of the general field of economics, the history of agricultural economics, the theory of agricultural economics, the problems of agricultural production, land tenure, land problems, agricultural commerce, agricultural co-operation, agricultural credit, statistics of agriculture, and prices, markets, and marketing.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — The same as for the degree of doctor of philosophy.

GRADUATE COURSES OFFERED.

110. THEORY OF AGRICULTURAL ECONOMICS. — Readings in French, German, and English on economics of agriculture. Alternate years, odd, 200 hours.
Credit, 3.
Professor CANCE.

111. CURRENT ECONOMIC PROBLEMS AND LITERATURE. — Department seminar throughout the year. Credit, 1 each term.

120. ECONOMIC HISTORY OF AMERICAN AGRICULTURE. — Spring term.
Credit, 3.
The DEPARTMENT.

121–122. HISTORY OF AMERICAN AGRICULTURE. — Special studies in the history of agricultural institutions, practices, or relations. Fall term, even years.
Credit, 5.
Assistant Professor JEFFERSON.

130. PROBLEMS OF AGRICULTURAL PRODUCTION. — The relation of the farmer to the food supply. May be taken in connection with Course 77. Fall term, yearly.
Credit, 5.
Professor CANCE.

140. Land Tenure and the Acquisition of Farm Land. — Readings, discussion, original exercises. Alternate years, even. Credit, 3–5
Professor Cance.

145. Farm Labor. — Reading and investigation. Credit, 3
Professor Cance.

150. Agricultural Commerce, Industry and Trade. — A study of trade movements and commercial activities relating to agricultural products. Fall term, alternate years, odd. Credit, 3–5.
Assistant Professor Jefferson.

155. The Agricultural Market. — A study of the forces, methods, and institutions of the market for agricultural products. Spring term, yearly.
Credit, 5.
Professor Cance.

156. Specific Problems in Marketing Farm Products. — Reports and discussions. Alternate years, odd. Credit, 3.
Professor Cance.

160. Elementary Principles of Statistics. — Chiefly related to Agriculture. Lectures, laboratory studies, and original work. Taken in connection with Course 79. Fall term, yearly. Credit, 5.
Assistant Professor Yount.

161. Advanced Statistics. — Winter term, yearly. Credit, 3.
Assistant Professor Yount.

162. Agricultural Prices. — Spring term, yearly. Credit, 3.
Assistant Professor Yount.

163. Specific Problems in Statistics of Agriculture. — Alternate years, even. Credit, 3–5.
Assistant Professor Yount.

165, Transportation of Agricultural Products. — Elementary discussion and report. Winter term, yearly. Credit, 5.
Professor Cance.

166. Specific Transportation Problems. — Original study, reading, and report on certain transportation problems related to agriculture. Alternate years, odd. Credit, 3–5.
Professor Cance.

170. Co-operation in Agriculture. — Elementary problems and discussion. May be taken in connection with Course 50. Winter term, yearly. Credit, 5.
Professor Cance.

171–172. Special Problems in Co-operation for Economic Purposes. — Study, original investigation, and discussion. Every third year, beginning 1922.
Credit, 3–5.
Professor Cance.

175. Agricultural Credit. — Readings and reports in addition to class lectures on agricultural credit. Taken in connection with Course 78. Spring term, yearly. Credit, 3–5.
Assistant Professor Yount.

185. Rural Law. — Corresponds to Course 75. Spring term, yearly.
Credit, 5.
Mr. Smart.

186. Studies in Agricultural Legislation. Credit, 3–5.
The Department.

190–195. Investigation of Various Problems related to Agricultural Economics. — Credit given on basis of time spent and reports submitted.

200. Thesis. — Research work in agricultural economics will be developed by four principal methods, namely, historical, statistical, accounting, and general field investigation. In all instances mastery of research methods includes facility in investigation, tabulation, and interpretation of results.

Minor Requirements.

Undergraduate prerequisites, 15 credit hours of economics and agricultural economics, including the following courses or their equivalents: Economics 25, Agricultural Economics 26 and 50.

Required work, Courses 111, 155, and 160, or equivalent courses.

Agricultural Education.

Major Requirements.

For the Degree of Master of Science.

Prerequisite Work. — A minimum of 25 undergraduate credits is required before beginning graduate study. These are to be the equivalents of Courses 51, 52, 55, 56, 75, and 80 as listed in this catalog, or permissible substitutes for them. Successful teaching experience will receive consideration.

Required Work. — A minimum of 50 credits, including the thesis, is to be earned from the following list of courses. A reasonable amount of graduate credit may be accepted from other institutions of good standing for partial satisfaction of the required total. In no case shall Courses 51 and 55 be taken by a graduate student for credit. The material of the other undergraduate courses may be used by special arrangement provided the work earns a grade of 85 or over and has not been taken before for credit.

Graduate Courses Offered.

100. History of Education — Ancient and Medieval. — The development of Education from the beginning of conscious educational practices to the close of the Middle Ages. Lectures, reading, reports, examination. Fall term.
Credit, 2–5.
Professor Glick.

102. History of Education — Modern. — A study of Educational theory and practice during modern times. Lectures, discussion, reading, reports, examination. Fall term. Credit, 2–5.
Professor Glick.

104. Vocational Education. — Laws, rulings, policies, and plans of Vocational Education in the United States. Lectures, reading, discussion, examination. Summer term. Credit, 5.
The Department and Vocational Division State Department of Education.

105. General Curriculum — Secondary Schools. — Principles and practices in curriculum determination. Lectures, reading, problem study, discussion, examination. Fall term. Credit, 5.
Professor Welles.

107. Special Curricula — Secondary Schools. — Studies of special type curricula in specific subjects. Lectures, reading, problem study, discussion, examination. Fall term. Credit, 2–5.
Professor Welles.

110. Rural Education. — May be general or special in character. Relates to aims, general character, curricula, and administration. Reading, problems, reports, examination. By arrangement. Credit, 3–5.
The Department.

115. Agricultural Teacher Training. — Has to do mostly with men in agricultural teaching service. Reading, conference, supervision of teaching. By arrangement. Credit, 3–5.
Professor Welles.

120. Intelligence and Aptitude Tests. — The theory and use of so-called intelligence tests and special aptitude tests. Lectures, discussions, reading, reports, laboratory work, examination. Spring term. Credit, 3–5.
Professor Glick.

122. Educational Tests. — The theory and use of standardized tests whose primary function is to measure school progress. Lectures, discussions, reading, reports, laboratory work, examination. Spring term. Credit, 3.
Professor Glick.

125. Senior High School: — Organization and Administration. — Lectures, reading, reports, examination. Winter term. Credit, 3.
Professor Welles.

127. Junior High School: — Organization and Administration. — Lectures, reading, reports, examination. Winter term. Credit, 3.
Professor Welles.

130. Advanced Educational Psychology. — This course affords opportunity for special study in any of the various phases of educational psychology. Lectures, reading, reports, experimentation, discussion, examination. Winter term. Credit, 5–10.
Professor Glick.

135. Educational Philosophy. — Primary consideration is given to the various aims of education both from the standpoint of theory and practice. Lectures, reading, reports, discussion, examination. Winter term. Credit, 5–10.
Professor Glick.

140. Educational Seminar. — Studies of educational problems and topics primarily by the thesis method. Conference and thesis. By arrangement. Credit, 3.
The Department.

145. Advanced Method Studies. — May be general methods or special methods in particular subjects. Reading, conference, reports, examination. Spring term. Credit, 5–10.
Professor Welles.

147. Supervised Teaching. — A limited opportunity for the graduate student to teach his regular classes under critical observation. Reading, teaching, discussion, lectures. By arrangement. Credit, 3.
Professor Welles.

200. Thesis. — Original work on an educational problem for new information or new applications of old information. Investigation, tabulation, and interpretation. Statistical methods for exactness wherever possible. Credit, 15–25.
The Department.

MINOR REQUIREMENTS.

Minor work is offered by the department for advanced degrees. Candidates must have had the equivalent of undergraduate Courses 51, 52, and 55 or permissible substitutes for them for a total of 15 credits as prerequisites.

Agronomy.

Major Requirements.

For the Degree of Doctor of Philosophy.

Prerequisite Work. — Candidates must have had undergraduate Courses 25 and 27 as described in this catalogue, and should have had thorough training in the elements of the natural sciences.

Required Work. — Studies will be assigned from the courses listed below. Thesis problems may be chosen in the subject matter of soils, fertilizers, or field crops.

The subject-matter content of the following courses is not fixed, but is determined in each individual case by the training, experience, and needs of the graduate student. This method permits a degree of flexibility which is conducive to the development of the individual capacity of the student.

For the Degree of Master of Science.

Prerequisite Work. — As above.

Required Work. — Assigned work will be selected from the courses listed below.

For the Degree of Master of Agriculture.

Prerequisite Work. — The same as for the degree of master of science in so far as it is essential to establish the professional approach to agronomy, but in addition the candidate must be familiar with agronomical practices.

Required Work. — As above.

Graduate Courses Offered.

110. Studies in the Culture of Field Crops. — Laboratory, field, or other problems concerning the tillage of field crops. Credit, 1–10.

115. The Fertilization of Field Crops. Credit, 1–10.

120. Studies in Harvesting and Storage. — Problems of method and time of harvesting and methods and conditions of storage, in relation to the keeping of field crops. Credit, 1–10.

125. The Improvement of Field Crops. — Readings, discussions, laboratory or field work in the improvement of field crops by breeding and selection. Credit, 1–10.

130. Technology of Field Crops. — The classification, grading, processing, and utilization of field crops. Credit, 1–10.

140. Soil Classification. — Laboratory, field, and library studies of methods and the principal groups, series, and types of soils. Credit, 1–10.

145. Studies in Soil Physics. — Problems concerning texture, structure, and other physical properties of soils. Credit, 1–10.

150. Moisture Relationships in Soils. — Readings and problems concerning the soil and moisture in their various relations. Credit, 1–10.

155. Studies in Soil Management. — Study of a wide range of problems arising in the management of soils for crop production. Credit, 1–10.

160. Soil Technology. — Includes studies of properties, behavior, and technical utilization of soils. Credit, 1–10.

165. Soil Reaction Studies. — Studies of hydrogen-ion concentration of soils as affected by natural agencies and conditions induced by practices of soil management. Credit, 1–10.

170. Studies of Soil Fertility. — Investigation of the factors and conditions affecting the productivity of soils. Credit, 1–10.

175. Organic Matter of the Soil. — Includes studies of the origin, properties, and methods of maintenance of soil organic matter, and its physical and biochemical relations to soil fertility. Credit, 1–10.

180. Fertilizer Technology. — Studies of the properties and behavior of fertilizer materials when unmixed with the soil. Credit, 1–10.

185. Fertilizers and the Soil. — Concerning the interrelationships of soils and fertilizers when mixed. Credit, 1–10.

190. Studies in Literature. — Practice in preparing abstracts and summaries of the literature bearing on selected topics. Credit, 1–10.

200. Thesis. Credit, 15–50.

Minor Requirements.

Prerequisites are as stated for major work. In addition studies suited to the needs of the candidate will be selected from the above courses.

Animal Husbandry.

Major Requirements.

For the Degree of Master of Science or Master of Agriculture.

Prerequisite Work. — Candidate must have had the following courses, or their equivalents, before he can enter graduate work in this department: Animal Husbandry 25, 26, 50, 52, 53, and 75. He should also be able to show evidence of experience in practical animal husbandry.

Required Work. — At least 50 credits must be earned from the following list of courses offered by the department.

Graduate Courses Offered.

100. Advanced Breed History. — Special study of the genetic and historical foundations of any modern breed of livestock and its developmental trends, accomplishments, and present status. Credit, 10.

110. Nutrition of Farm Animals. — An advanced course dealing with the nutritional physiology of animals and the chemistry of metabolism. Special emphasis is laid upon the role of proteins, minerals, and vitamines in the efficient production of animal products. Credit, 10.

120. Breeding of Farm Animals. — An advanced course dealing with the physiology of reproduction in domestic animals and with the laws of inheritance as evidenced through the various systems of breeding. The working of Mendelian principles in domestic animals is carefully considered. Credit, 10.

200. Thesis. — Research work in Animal Husbandry may consist of historical studies of the modern breeds of livestock, experimental studies in animal nutrition or breeding. Credit, 25.

Minor Requirements.

Minor work in animal husbandry may include undergraduate Courses 50, 53, 81, and such work in reading and compilation of material as the instructor may outline. Written examinations will be conducted at the completion of each term's work.

Bacteriology and Physiology.

Major Requirements.

For the Degree of Doctor of Philosophy.

Prerequisite Work. — Candidate must have had Courses 50, 51, 80, 81, and 82, or their equivalents, and Chemistry 51, 52, 53, or their equivalents, before he can enter upon graduate work.

Required Work. — Studies will be selected from the courses offered below. It will be the purpose of the department to distribute such studies among the courses offered in a manner to gain the greatest efficiency and a comprehensive knowledge of the entire field. The work will be conducted by prescribed readings, conferences, lectures, and laboratory exercises.

For the Degree of Master of Science.

Prerequisite Work. — The same as for the degree of doctor of philosophy.

Required Work. — Courses of a basic and applied character selected from the courses offered below which will prepare the student for effective effort.

Graduate Courses Offered.

100. History of Bacteriology. — Studies in the development of bacteriology from the late seventeenth century to the present time, especially planned to show the developments of bacteriology in relation to agriculture, public health, the arts, industry, and medicine. Credit, 1–5.

110. Physiological Studies on Bacterial Metabolism. — The study of physiological oxidations, biochemical changes, nitrification, ammonification, and biophysical phenomena associated with the functions of bacterial physiology. Credit, 5–20.

120. Agricultural Bacteriology. — Special lectures on bacteriology in relation to agricultural procedures. Open only to students well prepared in chemistry, soil, water, food, and dairy bacteriology, and having had Bacteriology 75 or its equivalent. Credit, 5–20.

130. Soil Bacteriology. — Accurate applications of microchemical methods are demonstrated. Biochemical and biophysical methods for measuring the physiological activities of soil microorganisms are studied. Nitrification, denitrification, and ammonification will be discussed in relation to their influence on soil fertility. Credit, 5–20.

140. Dairy Bacteriology. — Technical procedures used in establishing sanitation in relation to milk production and supply will be discussed. Modern methods involved in the preparation, control, and preservation of milk and dairy products are studied. Credit, 5–20.

150. Food Bacteriology. — Principles of food preservation and conservation; the application of scientific methods to the understanding of food fermentations and spoilage will be considered. This is arranged primarily for students with an excellent background in both chemistry and bacteriology. Credit, 5–20.

160. Hygienic Bacteriology. — Special consideration given to organization of disease control campaigns, laboratory management, the relationship of serology, immunology, and bacteriology to municipal, rural, and community health. Bacteriological, immunological, and serological procedures will be presented, and there will be discussion of problems showing their use for improving the condition and environment for human and animal life. Credit, 5–20.

170. Physiology, Human or Animal. — Given only to students who have had undergraduate Courses 63, 64, and 65, or their equivalents. Study of the physiology of the circulation with special reference to intermediate metabolism; to be followed by a course on the physiology of excretion. This course in physiology may be considered from the standpoint of human or animal physiology, according as the student may elect. Credit, 5–10.

190. Lectures and Study of Literature. Credit, 1 each term.

200. Thesis. — Some microbiological problem related to agriculture, food, or public health. Distributed as may be most beneficial for research work. Time and credit by arrangement. Credit, 15–50.

Minor Requirements.

Minor work in bacteriology may consist of undergraduate Courses 50, 51, 75, 80, 81, and 82 and other courses designed to support the major work, from among the courses offered above. The candidate will also be required to pursue graduate Course 190, or follow a course of reading and conferences through three terms. In case the candidate has had some of these courses, he will be required to take more advanced substitute courses.

Botany.

Major Requirements.

For the Degree of Doctor of Philosophy.

Prerequisite Work. — The equivalent of certain undergraduate courses, determined by the department in the case of each student, is prerequisite.

Required Work. — Candidates will be required to take Courses 100 through 107, and 180, 190, and 200. Courses 150 through 155 may be taken for graduate credit in certain cases. The maximum number of major credits which may be earned in this way is 29.

For the Degree of Master of Science

Prerequisite Work. — The requirements are the same as for the degree of doctor of philosophy.

Required Work. — Candidates will take Courses 100 and 101, and all courses from 102 through 107 which are given during their term of residence, also 180, 190, and 200. In certain cases Courses 150 through 155 may be taken, but not more than 20 credits may be earned in this way.

Graduate Courses Offered.

Courses 100 through 106 are lecture courses. They are given in rotation, except Courses 100 and 101, which come every year.

100. Plant Physiology. — The lectures will consider, under the nutrition of the plant: its chemical structure, absorption of various nutrient substances and their changes in the plant, assimilation and dissimilation of carbon and nitrogen by autotrophic and heterotrophic plants; under changes in the form of plants: growth and form under constant external factors, the influence of variable external and inner factors on growth, form, and development; and under plant movements: the various tropisms, nutations, etc. Supplemental demonstrations, laboratory work, and readings in the standard texts and journals. One lecture a week for 36 weeks. Credit, 3.

101. Plant Pathology. — A general consideration of the history, nature, and causes of plant disease; parasitism, predisposition, immunity, degeneration, natural and artificial infection, dissemination, epidemics, biologic strains, monstrosities and malformations, proliferation, prevention and control, economics of plant diseases. One lecture a week for 36 weeks. Credit, 3.

102. Plant Inheritance. — This course is planned to give the student a comprehensive understanding of the principles and facts of plant inheritance. A study is made of plant variations, Mendel's law of heredity, the physical basis of heredity as established by chromosome behavior, pure lines, mutations, species and graft hybrids, etc. One lecture a week for 12 weeks. Credit, 1.

103. Biologic Relations. — Consideration of certain phases of the morphological and physiological adaptations of plants with regard to insect visits; the role of thorns, hairs, tendrils, glands, etc. Various experiments are made to test out experimentally some of the existing theories concerning biologic adaptations. One lecture a week for 12 weeks. Credit, 1.

104. The Ecology of Plants. — This course deals with the water, light, and temperature relations of plants, and the various adaptations in response to these factors; the various types of plant formation; the migration of plants; the competition of plants; invasion and successions of plants under varied conditions; and the various types of alternations and zonations. One lecture a week for 12 weeks. Credit, 1.

105. Physiological Plant Pathology. — This course considers those plant diseases not due to bacterial or fungous parasites, but resulting from unfavorable physical or chemical conditions of the soil; from harmful atmospheric influences, such as too dry air, too much moisture, hail, wind, lightning, frost; from injurious gases and liquids; from lack of or too much light; from wounds. A knowledge of the normal physiology of the plant is required. Demonstrations and laboratory work will be given, together with assigned readings. One lecture a week for 12 weeks. Credit, 1.

106. History of Botany. — An historical survey of the science; lives of noted botanists; history of certain culture plants, such as wheat, corn, coffee, potato, rice, and their influence on civilization; reading. One lecture a week for 24 weeks. Credit, 2.

107. Methods in Drawing and Photographing for Thesis and Publication. — Twelve weeks. Credit, 1–3.

108. The Comparative Anatomy of Green Plants. — See undergraduate Courses 61–63.

109. Systematic Botany of the Higher Plants. — See undergraduate Courses 58, 59, and 60.

150. Systematic Mycology. — See undergraduate Courses 52–54.

152. Plant Histology. — See undergraduate Course 55.

154. Plant Pathology. — See undergraduate Courses 75–77.

155. Plant Physiology. — See undergraduate Courses 78–80.

180. Seminar. — A weekly seminar for members of the department staff, graduate students, and major senior students is held, at which important botanical papers are discussed. Attendance and participation are required. Credit, 3.

190. Collateral Reading. — Extensive reading of botanical literature in English, German, and French, designed to give the student a broad knowledge of the science is required of all major students. Final examinations are based in part upon this reading course. Credit, 5–10.

200. Thesis. — Each major student is required to select a problem in plant pathology or physiology (in other branches at the discretion of the department)

for original investigation, and the thesis must embody a distinct contribution to knowledge. An effort will be made to assign problems having some bearing on scientific and economic agriculture. The thesis work counts for not more than 50 per cent of the total number of major credits required for either degree.

MINOR REQUIREMENTS.

For a minor a student may take such of the work offered by the department as seems best suited to his major course. Courses 150 and 155 are primarily undergraduate work which may be taken for minor credit toward advanced degrees. In most cases no problem will be assigned.

Professors OSMUN, CLARK, TORREY, DORAN, and DAVIS.

Chemistry.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — The candidate must have taken undergraduate Courses 1 to 87, or their equivalent.

REQUIRED WORK. — The candidate will be required to take all the graduate courses listed below. He may also be required to spend at least one year at some other recognized institution, pursuing graduate study in chemistry. For the final examinations, questions will be selected from the entire field of chemistry, with special emphasis upon the lines of work covered by the research.

For the Degree of Master of Science.

PREREQUISITE WORK. — Courses 1 to 63 required; 75 and 80 desirable.

REQUIRED WORK. — Courses 101, 109, 110, 111, 112, 114; and 6 to 11 credits, according to the nature of the work, from courses 102, 103, 104, 105, 106, except that if the candidate has not had courses 75, 80, 86, and 87 these must be taken, and may be substituted for some of the courses 102 to 106. The candidate must pass a final written and oral examination before the department upon undergraduate Courses 1 through 80, as well as upon all graduate work taken in chemistry.

GRADUATE COURSES OFFERED.

101. INORGANIC PREPARATIONS. — Laboratory. The preparation of chemical products from raw materials. The manufacture and testing of pure chemicals. The laboratory work is essentially synthetic in nature, and is designed to aid in acquiring a more adequate knowledge of inorganic chemistry than is to be obtained by chemical analysis alone. Any term. Credit, 3 or 5.

Assistant Professor SEREX.

102. ADVANCED INORGANIC PREPARATIONS. — Laboratory. Continuation of Course 101. Any term. Credit, 3 or 5.

Assistant Professor SEREX.

103. ADVANCED ANALYTICAL CHEMISTRY. — Laboratory. This course may be taken in part as follows: (a) electrolytic analysis, 6 credits; (b) ultimate analysis, 3 credits; (c) special analytical work to meet the needs of the individual student, 5 credits. In addition the following subjects may be taken, if desired: (d) fertilizers, 5 credits; (e) insecticides, 3 credits; (f) milk and butter, 5 credits. (a), (b), (c) may be taken any time; (d), (e), (f) should be taken at the time the undergraduate course is given.

Professor PETERS.

104. ADVANCED PHYSICAL CHEMISTRY. — Laboratory. Measurement of the electrical conductivity of solutions; degree of ionization; ionization constants; per cent hydrolysis of aniline hydrochloride from conductivity measurements;

solubility product by the conductivity method; velocity of saponification by conductivity; neutralization point by conductivity; vapor pressure determinations; critical temperature of carbon dioxide or sulphur dioxide; transport numbers; preparation and properties of colloidal solutions; transition points by dilatometric method; heat of solution of ammonium chloride and potassium nitrate; adsorption of iodine by charcoal; determination of hydrogen ion concentration. To each student separate work will be assigned. Any term. Credit, 5.
Assistant Professor SEREX.

105. ADVANCED ORGANIC CHEMISTRY. — Laboratory. The preparation of compounds not included in Courses 51, 52, 53, such as the Kolbe synthesis of salicylic acid; benzophenone and Beckmann's rearrangement; rosaniline, malachite green, Congo red, indigo, and other dyes; synthesis of fructose; Grignard reaction. To each student separate work will be assigned. Any term. Credit, 5.
Professor CHAMBERLAIN.

106. ADVANCED PHYSIOLOGICAL AND FOOD CHEMISTRY. — Laboratory. An intensive study of some of the more important physiological processes, physiological compounds, or food ingredients. Studies of milk, blood, urine, or other physiological factors under various metabolic and pathologic conditions. To each student separate work will be assigned. Any term. Credit, 5.
Prerequisite, Chemistry 80. Mr. BUTTS.

109. THEORETICAL OR ANALYTICAL CHEMISTRY. — Lectures. A study of the development of the electron conception of valence; the structure and size and compressibility of atoms. A general survey of the analytical processes and the theory underlying. Third term. Subjects alternate annually. Credit, 1.
Professor PETERS.

110. ORGANIC CHEMISTRY. — Lectures. Some of the following topics will be considered both theoretically and industrially: alkaloids, synthetic dyes, essential oils, terpenes, rubber, cellulose; the study of methods for carrying out general reactions; isomerism, tautomerism, condensation, etc. First term. Subjects alternate annually. Credit, 1.
Professor CHAMBERLAIN.

111. ADVANCED PHYSIOLOGICAL AND FOOD CHEMISTRY. — Lectures. A study of the recent advances in this field. An intimate treatment of the more important physiological factors and their relations to health, nutrition, and growth. Second term. Subjects alternate annually. Credit, 1.
Mr. BUTTS.

112. THEORETICAL AND PHYSICAL CHEMISTRY. — Lectures. A general outline of special topics selected from recent publications covering theoretical and physical chemistry. Third term. Subjects alternate annually. Credit, 1.
Assistant Professor SEREX.

114. SEMINAR. — Conferences, reports, or lectures. Each term, once a week.
Credit, 1.
Professor LINDSEY.

200. THESIS. — Research, and, in the case of a degree, the preparation of an acceptable thesis in agricultural, analytical, organic, physiological, or physical chemistry, under the direction of the professor in charge of the work. Credit determined by work done.

MINOR REQUIREMENTS.

Work may be selected from any of the undergraduate Courses 51 to 87, or any of the graduate courses for which the student is prepared. In addition, the candidate may be required to pass a final written and oral examination before the department upon his entire minor work.

Dairy Husbandry.

MAJOR REQUIREMENTS.

For the Degree of Master of Science.

PREREQUISITE WORK. — Undergraduate courses: Physics 25, 26, and 27; Bacteriology 50, 51, and 80; Chemistry 30 and 81, and prerequisite work; Dairy 50, 51, 52, 75, 76, 77, 78, 79, and 80 will be required for graduate work, and any student who has not passed these courses or their equivalent will be required to make up such work without graduate credit.

REQUIRED WORK. — Studies will be assigned from courses listed below or from correlated work in other departments.

GRADUATE COURSES OFFERED.

101. HISTORY AND DEVELOPMENT OF DAIRYING. — A review of the early history of dairying and factors in the industry contributing to its present development. Credit, 3–10.

102. ICE CREAM PROBLEMS. — A study of existing scientific, technical, and marketing problems in the field of ice-cream making. Credit, 2–10.

103. MARKET MILK PROBLEMS. — Consideration of production, processing and distribution of milk, the nutritional value of milk, chemical and bacteriological aspects of milk handling. Credit, 2–10.

104. SURPLUS MILK PROBLEMS. — The economical disposal of seasonal surpluses through cheeses, butter, milk drinks, etc. Credit, 2–10.

105. DAIRY PLANT MANAGEMENT. — The selection, construction, and arrangement of dairies and dairy machinery, and economical operation of same. Credit, 2–10.

195. SEMINAR. Credit, 1–2.

200. THESIS. — Original research work having a bearing on some important problem in dairying. Credit, 15–25.

MINOR REQUIREMENTS.

Minor work in Dairy Husbandry may include undergradute Courses 52, 75, 76, 78, and such other work as the instructor may outline. Written examinations are required at the completion of each term's work.

Entomology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — The candidate must have taken undergraduate Courses 26, 28, 52, 53, 55, 57, 75, 76, 77, 78, and 79 or their equivalent. Opportunities to make up any deficiencies will be available while the graduate work is being carried on.

REQUIRED WORK. — Courses from the list below, consisting of lectures, laboratory work, advanced readings, seminar, and thesis.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — A major course for the master of science degree will consist of subjects from the list below selected as far as possible to meet any special needs of the candidate, and will be about half of the work required for the doctor of philosophy degree.

GRADUATE COURSES OFFERED.

MORPHOLOGY. — 101–120.

101. Embryonic development of insects and polyembryony.
Professor CRAMPTON.

102. Metamorphosis and its interpretations.
Professor CRAMPTON.

103. Advanced external and internal anatomy.
Professor CRAMPTON.

104. Insect histology and physiology.
Professor FERNALD.

105. Ancestry and development of insects, including fossil forms.
Professor CRAMPTON.

106. Hermaphroditism in insects.
Assistant Professor ALEXANDER.

107. Hybrids.
Professor FERNALD.

108. Parthenogenesis, pedogenesis, and heterogeny.
Professor CRAMPTON.

109. Chemistry and physics of insect colors.
Professor FERNALD.

110. Color patterns, their significance and value.
Professor FERNALD.

111. Luminosity.
Professor FERNALD.

112. Insect teratology.
Assistant Professor ALEXANDER.

113. Variation in insects.
Assistant Professor ALEXANDER.

ECOLOGY. — 121–140.

121. Dimorphism and polymorphism.
Assistant Professor ALEXANDER.

122. Mimicry, including concealment, protective devices, and warning coloration.
Professor CRAMPTON.

123. Architecture of insect structures.
Professor FERNALD.

124. Relation of insects to plant fertilization and its importance.
Professor FERNALD.

125. Insect products of value to man.
Professor FERNALD.

126. Geographic distribution and methods of distribution of insects, with consideration of life zones, barriers, etc.
Assistant Professor ALEXANDER.

127. Insect migrations.
Assistant Professor ALEXANDER.

128. Insect behavior and experimental entomology.
Professor CRAMPTON.

129. Enemies of insects.
Professor FERNALD.

130. Duration of life.
Professor FERNALD.

ECONOMIC ENTOMOLOGY. — 141–160.

141. Control methods.
Professor FERNALD.

142. Insect photography and methods of preparing illustrations.
Professor FERNALD.

143. Field work and life history investigations, with methods for keeping records.
Professor FERNALD.

144. Legislation about insects.
Professor FERNALD.

145. Studies of insecticides and their application.
Professor FERNALD.

146. Insectary methods.
The DEPARTMENT.

147. Biological control of insects.
The DEPARTMENT.

SYSTEMATIC ENTOMOLOGY. — 161–179.

161. History of entomology and of classifications.
Professor FERNALD.

162. Lives and works of prominent entomologists.
Professor FERNALD.

163. Abundance of insects.
Professor FERNALD.

164. Important collections, public and private; their location and their value.
Professor FERNALD.

165. Types of insects; their significance, importance, and location.
Professor FERNALD.

166. Rules of nomenclature and how they are used.
Assistant Professor ALEXANDER.

167. Methods for collecting, preparing, preserving, and shipping insects.
The DEPARTMENT.

180. SEMINAR. — Reports on the current literature of entomology; special reports; monthly meetings.

190. ADVANCED AND COLLATERAL READINGS. — The best articles on various topics in entomology are assigned for study, and the subjects are included in the final examinations.

200. THESIS. — Original research on one or several topics in morphology, ecology, economic and systematic entomology. This may require from one-half to two-thirds of the total working time of the student.

MINOR REQUIREMENTS.

Minor courses will cover such parts of the work outlined above as will be most likely to prove useful in connection with the majors taken by the students, or in their future work. It is not required that such men shall have had all the undergraduate work in entomology given at this college, their credit for a minor beginning where their own undergraduate training in the subject ended.

Horticulture.

Graduate work is offered in various lines of horticulture. For the most part this is divided into the different departments which constitute the college Division of Horticulture, as follows: pomology, floriculture, landscape gardening, forestry, and market gardening. For work in these lines application should be made direct to the heads of the several departments.

Besides this work, however, opportunity is offered for graduate study in general horticulture, including topics from the several organized departments mentioned, and also questions relating to plant breeding, general evolution, propagation, manufacture of horticultural products, etc. This general work is under the direction of Professor Waugh, head of the Division of Horticulture.

Landscape Architecture.

MAJOR REQUIREMENTS.

For the Degree of Master of Landscape Architecture.

PREREQUISITE WORK. — 1. The undergraduate courses in the college known as Landscape Gardening 50, 51, and 52; Drawing 25, 26, and 27; Horticulture 50 and 51, and Mathematics 26 and 27 will be considered prerequisite, and any student who has not passed these courses, or their equivalent, will be required to make up such work without graduate credit.

2. Each student before he may receive the master's degree with a major in this department must convince his instructors that he has a genuine aptitude for some branch of landscape architecture, either in design, construction, or management.

3. The minimum period of graduate study will be one and one-half years. At least one year of this time must be spent in residence at the college. One year must also be spent in practice outside of the college. The work done outside the college may be prescribed by the department, and must be fully reported to the department in writing. It is essential, further, that the candidate secure the written approval of his employers outside the college. The department may, at its discretion, require a longer period of study at the college or a longer apprenticeship outside the college.

4. Every student before receiving his master's degree in landscape architecture must have given some thorough and fruitful study to each of the principal branches of the subject, *viz.*, theory, design, architecture, construction, maintenance, and office practice. As far as possible these studies will be of a practical nature, that is, they must be made upon going projects.

5. While great freedom is allowed to graduate students in their plans of work, a certain portion of time will always be given to systematic courses in instruction. Courses known as Landscape Gardening 75, 76, 77, 78, 79, 80, 81, and 82 are required, and may or may not be accepted for graduate credit, at the discretion of the department.

GRADUATE COURSES OFFERED.

190. THEORY. — Special studies in the history and theory of art and of landscape architecture. Credit, 2–10.
The DEPARTMENT.

191. DESIGN. — Individual problems in any or all branches of design, including estates, parks, playgrounds, public grounds, etc. Credit, 2–10.
The DEPARTMENT.

192. CONSTRUCTION. — Individual problems by arrangement, including engineering, estimating, cost accounting, and methods of construction.
Credit, 2–10.
The DEPARTMENT.

193. MAINTENANCE. — Special studies, experimental work of assigned problems in various forms of grounds maintenance, costs, and methods. Credit, 2–10.
The DEPARTMENT.

194. PRACTICE. — Professional field work under supervision, conducted upon going projects as opportunity offers. By arrangement. Credit, 2–10.
The DEPARTMENT.

195. SEMINAR. — Regular meetings for conference. Credit, 1–5.
Professor WAUGH.

200. THESIS. — Each student before receiving the master's degree with a major in landscape architecture must present a satisfactory thesis or complete project. A thesis will consist of a careful original study of some problem in landscape architecture, presented in typewritten form with any necessary illustrations, such as photographs, diagrams, drawings, etc. A project will consist of a completed set of studies of some suitable landscape-gardening problem, such as the design of a park, a real estate subdivision, an extensive playground. Such a project will usually consist of —

(*a*) Original surveys, including topography.
(*b*) Block plans, showing original design.
(*c*) A rendered plan or plans of the main features.
(*d*) Detailed working drawings.
(*e*) Estimates of cost.
(*f*) Complete report and letter of transmittal.

Credit, 5–20.

MINOR REQUIREMENTS.

Any student electing a minor in landscape architecture will be directed to take such courses from the regular catalogue list as may seem most suitable to him. Under ordinary circumstances no other work will be given to students electing minors. In special cases, however, individual problems will be assigned and individual instruction given. These exceptions will be made in cases where by so doing, it is possible to give the student material assistance in the plan of his major work.

Mathematics and Physics.

No regularly outlined major in mathematics and physics is offered at present but such a course may be arranged for individual students. As a minor, work in these subjects is available and would be selected in the lines most needed by the student in connection with his major in each case.

The requirement of 25 credits for a minor may be taken in either subject or divided between them.

Pomology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must have had the equivalent of the courses required for graduation from this college; also sufficient practical experience to enable them to understand and appreciate the problems of orchard practice.

REQUIRED WORK. — The work outlined below will be required of all candidates.

For the Degree of Master of Science.

PREREQUISITE WORK. — The same as for the degree of doctor of philosophy.

REQUIRED WORK. — One-half of the work outlined below, selected to meet the needs of the individual student, will be required.

GRADUATE COURSES OFFERED.

101. EXPERIMENTAL METHODS. Credit, 15–20.

A critical study of the methods of research that have been used or may be helpful in pomological work. The following topics will be considered from the point of view of the investigator in pomology.

1. Statistical methods.
2. Measures of growth and yield.
3. The conduct of plot experiments.
4. Methods of soil study in their relation to pomological research.
5. Chemical methods of pomological research.
6. Methods of physiology applicable to fruit plants.
7. Microchemistry.

102. POMOLOGICAL RESEARCH. Credit, 15–20.
A critical survey of past and current research work in pomology. Semiweekly meetings for reports and discussions will be held. The following topics will be taken up:

1. Orchard soil management.
2. Soil fertility and fertilizers.
3. Physiology of pruning tree fruits and bush and vine fruits.
4. Fruit bud differentiation.
5. Sterility and fertility.
6. Genetics of fruit plants.
7. Climatology and winter injury.
8. Advanced morphology.
9. Spraying machinery and equipment.
10. Special practices.

103. ADVANCED LABORATORY WORK. Credit, 5–12.
Each student will be required to become familiar with the research work of the department and to have a share in it. So far as this has value as graduate work, he will receive credit.

104. HISTORY OF POMOLOGY. Credit, 2–5.
The men, institutions, and other influences that have contributed to the development of the science and art of pomology.

105. HORTICULTURAL TAXONOMY. Credit, 2–3.
A study of the history and development of plant classification with special reference to horticultural plants. A study of modern classification carries with it an expression of opinion as to the evolution of cultivated plants.

106. ADVANCED SYSTEMATIC POMOLOGY. Credit, 6–10.
The principles of systematic pomology including a study of nut and subtropical fruits not usually dealt with in undergraduate courses. Opportunity is also offered for study of leaf and general tree characters of nursery and orchard trees and the relationship of varieties as indicated by these characters as well as those of the fruit.

200. THESIS. Credit, 40–50.
Each student will be required to carry out an original investigation of an assigned problem. In planning, executing, and interpreting the data of this problem he must show marked ability. The results are embodied in a thesis to be passed upon by the Department and the Graduate Staff.

MINOR REQUIREMENTS.

Students taking a minor in pomology will select such of the above courses as may be suited to their needs. Certain advanced undergraduate courses may also be taken for minor credit.

Poultry Science.

MAJOR REQUIREMENTS.

For the Degree of Master of Science or Master of Agriculture.

PREREQUISITE WORK. — The postgraduate course presupposes all undergraduate work or its equivalent, together with practical experience. Without the latter, students will be unable to handle Courses 140, 150, and 160. At the discretion of the instructor in charge, graduate students may be required to pursue undergraduate courses in other departments without credit.

REQUIRED WORK. — All the courses listed below. Practical poultry work may be required, but no credit will be given for such work.

GRADUATE COURSES OFFERED.

101. SCIENCE OF POULTRY HUSBANDRY. — A review of the entire field of poultry literature, including books, bulletins, journals, and other special articles. A written report on one or more subjects is required.

110. POULTRY PROBLEMS AND LITERATURE. — A critical review and a criticism of the more important experiments carried on at various stations in this and other countries; also a study of poultry conditions in foreign countries, methods of management, etc., besides a detailed study of some of the largest poultry projects in this country.

120. ANATOMY (GROSS AND HISTOLOGICAL), PHYSIOLOGY, AND SURGERY. — This course requires a careful study of the anatomy and physiology of the fowl. Special attention is given to a study of those structures concerned with practical poultry problems. Instruction in surgical technique, adapted to fowls, may also be given.

130. BREEDING. — The student will carry on such breeding experiments as time and facilities permit. He may also do work in connection with our regular experimental projects. A detailed study of the pertinent literature will be required. Animal Husbandry 53, or its equivalent, is a prerequisite.

140. FEEDING AND NUTRITION. — A study of the relation of various feeds to the morphology and physiology of the fowl. Special attention is given to the effects of various nutrients on growth, sexual maturity, egg production, character of plumage, and condition of flesh. Complete rations as well as methods of feeding are fully considered.

150. BROODING. — Studies will be made upon the relation between viability and rate of growth and the following topics: type of brooder, number of chicks in brood, ventilation, humidity, sanitation, exercise, and weather conditions; also a comparison of natural methods with artificial methods of rearing chicks.

160. INCUBATION AND EMBRYOLOGY. — A number of problems of a practical, scientific, and mechanical nature relating to incubation are considered. The work in embryology is of an advanced nature, dealing with its relation to morphogenesis and heredity, and presupposes an elementary knowledge of the embryology of the chick.

170. POULTRY DISEASES AND SANITATION. — In this course a study is made of various problems in poultry sanitation, with particular reference to methods relating to the control and eradication of disease.

200. THESIS. — Research work may be carried out in the following lines: breeding, nutrition, brooding and incubation, and embryology. Originality and thoroughness are particularly emphasized.

MINOR REQUIREMENTS.

Courses 101 and 110 are designed particularly for minors.

Rural Sociology.

MAJOR REQUIREMENTS.

For the Degree of Doctor of Philosophy.

PREREQUISITE WORK. — Candidates must take, or pass by satisfactory examination, the following courses: Sociology 27, 50, 51, 52, 54, and 75.

REQUIRED WORK. — Candidates will be required to select from the courses listed below as graduate courses a field for investigation and intensive study. Candidates for the doctorate must take all courses listed as graduate.

For the Degree of Master of Science.

Prerequisite Work. — The same as for the degree of doctor of philosophy.

Required Work. — Not less than 50 credit hours will be required from the courses listed below. The department will make such selection as may best meet the interest of the individual student.

Graduate Courses Offered.

177. Field Work of an Investigational Nature. — Research methods employed by sociologists — measurements, exploration, criticism, surveys; scientific value of the representative sample; quantitative measurements versus observation, comparison, and correlation; the statistical method; scholarly application of research methods by members of the class. Credit, 3.
Assistant Professor Cutler.

178. Rural Social Surveys. — The social survey in actual practice; the bird's eye view; the segmental survey; using the statistical method; reporting and publishing the findings. Credit, 3.
Assistant Professor Cutler.

179–181. Seminar. — The seminar described under Rural Sociology 79, 80, and 81. Graduate students render reports on research in which they engage, and upon selected portions of current literature. The reports serve as the basis for general discussion. Credit, 2.
Assistant Professor Cutler.

182. Social Conditions of American Rural Life. — Social and economic factors in rural progress; farm income and farm life. Credit, 2.
Assistant Professor Cutler.

183. Social Conditions of Old World Rural Life. — A sociological investigation of rural life in Europe, the Orient, and the Far East; rural co-operative enterprise in Denmark; agriculture in China after one hundred twenty generations. Credit, 2.
Assistant Professor Cutler.

186. Farmers' Organizations. — A study of social and economic co-operation. Credit, 2.
Assistant Professor Cutler.

187. Town and Village Rural Life. — The agricultural village; the small town in relationship to its environing neighborhoods. Credit, 2.
Assistant Professor Cutler.

190. Rural Government. — Proposed improvements in rural local government. Credit, 2.
Assistant Professor Cutler.

191. Rural Leadership. — Qualities and methods making for successful leadership in rural communities. Credit, 2.
Assistant Professor Cutler.

192. Rural Conditions in the Caribbean Region. — A sociological study of rural life and industry in the American possessions and protectorates; relation of the West Indies to the United States. Credit, 2.
Assistant Professor Cutler.

193. The League of Nations and Agriculture. — Agricultural problems in their international aspects. Credit, 2.
Assistant Professor Cutler.

200. Thesis. — Upon an approved subject, and must be a valuable contribution to knowledge. Especial stress is laid upon the feature of originality in the case of candidates for the doctorate.
Credit, for master's degree, 25; for doctor's degree, 50.

Veterinary Science.

Animal Pathology.

A minor consisting of two graduate courses (10 credits) in animal pathology, together with undergraduate courses (15 credits) in veterinary science, or bacteriology and physiology (see pages 64–66) is offered by this department.

120. General Pathology. — Arranged to meet the need of graduate students who have not pursued a course in general pathology. Reviews in gross and microscopic animal anatomy, followed by demonstrations and discussions on morbid anatomical phases of pathology (pathological histology). A written examination will be given at the end of the term. Winter term. Credit, 5.

140. Laboratory Methods of Diagnosis in Veterinary Science. — This course will consider bacteriological, biochemical, and serological methods now used as aids in animal pathology and in the diagnosis of animal diseases. Especial emphasis will be placed upon laboratory management, interpretation and classification of laboratory data, and the relationship of laboratory work to epizootics, epidemics, and the public health. A written examination will be given at the end of the term. Spring term. Credit, 5.

Zoology and Geology.

Courses in zoölogy and geology may be available in connection with the fulfillment of requirements in a minor for an advanced degree. The nature of the work will vary according to circumstances, and may be intensive in a special field or of somewhat general character, depending on the student's needs and his knowledge of the particular branch of science in which he wishes to study further.

The Summer School.

The summer session offers courses of collegiate grade only. Both undergraduate and graduate courses are given, intended for school superintendents, normal school, high school, college, and university teachers, college undergraduates, and any other serious student who is suitably prepared. When satisfactorily completed, these courses carry collegiate credit.

Admission.

There are no formal examinations for admission to the summer school. Undergraduate students are admitted to such courses as their preparation justifies. Admission to the graduate school will be granted to graduates of the Massachusetts Agricultural College and to the graduates of other institutions having substantially equivalent requirements for the bachelor's degree.

The following schedule of courses, given in the summer of 1928, indicates the character and extent of the work, but is subject to modification.

Education:
- Principles and Methods of Teaching.
- History of Philosophy and Practice in Education.
- Introduction to Psychology.
- Educational Psychology.
- Secondary Education.
- Special Methods in Teaching Vocational Agriculture.
- Tests and Measurements.
- Supervised Teaching.
- Experimental Psychology.
- Modern Trends in Educational Psychology.
- The Employed Teacher of Agriculture.
- Vocational Education.

Horticulture:
- Garden Design.
- Surveying and Mapping.
- Plant Materials.
- Garden Flowers and Bedding Plants.

Science:
- Insect Life.
- Botany for the Teacher.
- Public Health.
- First Principles of Geology and Physiography.
- Historical Geology.
- Physiological Chemistry.
- General Economic Entomology.

Home Economics:
- Clothing.
- Foods.
- Home Furnishing.
- Methods in Teaching Home Economics.

Dramatic Presentation.

American Literature.

Fees.

The tuition fee for undergraduate work in the summer session is ten dollars together with a recreation fee of two dollars, and laboratory fees in certain courses.

For further information, write or apply to Roland H. Verbeck, Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

For information concerning graduate work in the summer school, write or apply to Henry T. Fernald, Director of the Graduate School, Massachusetts Agricultural College, Amherst, Mass.

Non-Degree Courses of Instruction.

THE STOCKBRIDGE SCHOOL OF AGRICULTURE.

General Information.

Under the name of "The Two-year Course in Practical Agriculture," this school was organized in 1918 at the request of the Massachusetts Legislature, to meet the demand for a short course in agriculture which might be taken by students who either could not satisfy college entrance requirements or who, for one reason or another, were unable to take the collegiate course. Since its organization the School has registered over 1,300 students and now has over 500 graduates located largely in Massachusetts, although they are also to be found throughout New England and even in Florida, California, and many other states of the Union. More than 200 students were registered in the School during the year 1927–1928.

In May, 1928, by vote of the trustees of the College, the name of the course was changed to "The Stockbridge School of Agriculture." It is expected that the new name will more clearly indicate the distinction between the degree and non-degree courses offered at the Massachusetts Agricultural College and correct the impression that students who take this course have completed two years of collegiate work. Graduation from the Stockbridge School of Agriculture does not satisfy the entrance requirements of the College, and Stockbridge School of Agriculture credits are not accepted by the College as equivalents of any part of the requirements for the B.S. degree.

As the course is now organized, students may specialize in any one of seven vocations: animal husbandry, dairy manufactures, floriculture, horticulture, pomology, poultry, or vegetable gardening. A general course is also provided for women who do not wish to specialize in any one of the above vocations, but who want to prepare for rural life. Specialization in a vocation does not prevent students from securing a general working knowledge of other subjects. The Stockbridge School will appeal not only to young men and women, but also to men and women of mature years and practical experience who wish to know more about the business of farming or associated agricultural industries. The School is not intended for students enrolled in a high school; such students should complete their high-school course before seeking admission to this school.

Entrance Requirements.

Applicants for admission must be at least seventeen years of age and must have completed at least an elementary school course or its equivalent. Before being enrolled for the work of the second year, students must have completed six months' practical experience approved by the supervisor of placement training.

Students who are already enrolled in high schools and who wish to enter this school before the completion of the high-school course, should bring a statement, either from the principal of the high school or from the parent or guardian, requesting enrolment.

Instruction.

The instruction is given by the regular faculty by means of classroom teaching, laboratory exercises, and practical work. The work of the classroom is supplemented by demonstration work in the laboratory, dairy room, greenhouse, and stables, and by a six months' period of farm placement training during the spring and summer following the second term of resident instruction. The course is designed to offer plain, practical, direct information, and to establish the underlying reasons for, as well as methods employed in, the various operations.

Credit and Diploma.

In order to obtain a diploma, the student must complete satisfactorily all the work required in the vocational course which he has selected. This course consists of five terms of class and laboratory instruction, supplemented by six months of practical experience gained between the second and third terms of resident instruction and subject to the approval of the supervisor of placement training. A total of 125 credits is required for graduation, of which 100 credits are assigned to the work of the five terms in residence and 25 to the six months' placement training. No student failing to meet the requirements of his six months' summer training can be enrolled for the three terms of the second year, since he is not entitled to the diploma of the School.

Graduates of county schools of agriculture or of agricultural departments of high schools may complete the course for a diploma in one year if they are recommended by the director of the county school or by the instructor in charge of the department of agriculture in the high school.

Special Catalog.

For a complete catalog of the Stockbridge School of Agriculture, containing an application blank, write or apply to Director Roland H. Verbeck, Massachusetts Agricultural College, Amherst, Mass.

THE WINTER SCHOOL.

Short Courses are based on the idea that the motive which inspires study is the most significant factor in study itself, and that this motive rises when the student himself realizes he faces a problem that calls for a solution. Therefore, there is no age limit. Enrolled in short courses are found the young and the old, the experienced and the inexperienced, the theoretical and the practical. In this grouping there is a value, since students learn from each other as well as from the instructors. Practically all Short Course students intend to make a direct application of the knowledge given. Hence the aim of Short Course work is to offer the largest amount of information and training in agricultural and horticultural lines in the shortest possible time. During the past twenty years Short Courses have served hundreds of students in this Commonwealth, and the demand for these courses in recent years has steadily continued.

The Winter School has been established for a number of years at the college, and has proved to be very popular with farmers, their wives, sons, and daughters, teachers, college graduates, and others. This school begins about the first of January. Instruction was offered last year in —

Soil Fertility.
Field Crops.
Types and Breeds of Live Stock.
Live Stock Feeding.
Animal Breeding.
Farm Management.
Farm Accounts.
Farm Motors.
Dairy Bacteriology.
Animal Diseases.
Poultry Feeding and Culling.
Poultry Breeding and Sanitation.
Poultry Housing, Management, and Farm Organization.
Incubation, Brooding, and Marketing.
Vegetable Gardening.
Principles and Methods of Teaching.
Special Methods in Vocational Agricultural Teaching.
Agricultural Teaching Improvement Problems in Massachusetts.
Tree Fruits.
Pruning Tree Fruits.
Spraying.
Small Fruits.
Harvesting and Marketing.
Horticultural Manufactures.
Floriculture.
Marketing Farm Products.
Botany.
Entomology.
Rural Sanitary Science and Hygiene.
Agricultural Opportunities for Women.
Food and Nutrition.
Textiles and Clothing.
Home Management.
Health Education.
Dairying.
Greenskeepers' Course.

A series of special two-week courses in ice-cream making, butter making, milk testing, and market milk are offered. During the two weeks the student devotes all of his time to the work of the special course in which he has enrolled. The instruction lasts throughout the day from 8 to 5. These Courses meet a very definite need in the State for those who wish instruction, but who cannot attend for a longer period of time, and who do not wish to take other subjects.

Fees.

For all students taking the full ten-weeks term of the Winter School there is a tuition fee of $10 and, in addition, a registration fee of $5. There are no laboratory fees in connection with any of the courses.

For further information, write or apply to Roland H. Verbeck, Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass.

REGISTRATION, 1928–29.

Graduate Students

From October 1, 1927, to October 1, 1928.

Albro, Gardner M. B. S., Rhode Island State College	Newport, R. I.
Allen, Thomas A.B., Colgate University.	Belchertown.
Barber, Elmer E. B.S., Massachusetts Agricultural College.	Jamaica Plain.
Boden, Frank J. H. B.S., Massachusetts Agricultural College.	North Wilbraham.
Bower, James, Jr. B.S., Massachusetts Agricultural College.	Holyoke.
Brewster, Sam F. B.S., Texas Agricultural and Mechanical College.	Belton, Tex.
Briggs, Lawrence E. B.S., Massachusetts Agricultural College.	Rockland.
Brown, Lorimer H. B.S., Middlebury College.	Northampton.
Carley, Mrs. Abby P. B.S., Connecticut College.	Stonington, Conn.
Carpenter, David F. B.S., Massachusetts Agricultural College.	Millers Falls.
Cartwright, Carlton O. B.Voc. Agri., Massachusetts Agricultural College.	Northampton.
Chapman, Roy A. B.S., University of Minnesota.	St. Peter, Minn.
Clagg, Charles F. B.S., Massachusetts Agricultural College.	Barnstable.
Clark, Harold E. B.S., Massachusetts Agricultural College.	Montague.
Clark, Hermon R. B.S., University of Maine.	Springfield.
Clarke, Miriam K. B.A., Mt. Holyoke College.	Abington.
Cowing, William A. A.B., Colby College.	West Springfield.
Crooks, Clarence A. B.S., Massachusetts Agricultural College.	North Brookfield.
Crooks, G. Chapman A.B., Amherst College.	North Brookfield.
Dirks, Charles O. B.S., Kansas State Agricultural College. M.S., Iowa State College.	Orono, Me.
Dufresne, Virginia R. A.B., Mt. Holyoke College.	Springfield.
Dull, Malcolm F. A.B., Hope College.	Muskegon, Mich.
Emery, Herbert M. B.S., Massachusetts Agricultural College.	Newburyport.
Farrar, Clayton L. B.S., Kansas State Agricultural College.	Amherst.
Fessenden, Richard W. B.S., Massachusetts Agricultural College.	Middleboro.
Fitzgerald, Lillian A. B.S., Massachusetts Agricultural College.	Holyoke.
Foley, Mary J. B.S., M.S., Massachusetts Agricultural College.	Amherst.
France, Ralph L. B.S., University of Delaware.	Amherst.
French, Arthur P. B.S., Ohio State University. M.S., Massachusetts Agricultural College.	Amherst.
Galbraith, Leo L. B.S., Massachusetts Agricultural College.	Gladstone, N. J.
Gifford, Flavel M. B.S., Massachusetts Agricultural College.	Hatfield.
Gilbert, Chauncey McL. B.S., Massachusetts Agricultural College.	Amherst.
Ginsburg, Eli B.A., Amherst College.	Amherst.
Goldberg, Maxwell H. B.S., Massachusetts Agricultural College.	Stoneham.
Goodwin, William I. B. S., Massachusetts Agricultural College.	North Amherst.
Gorman, Katherine L. B.S., Simmons College.	Holyoke.

Griffiths, Francis P. B.S., University of Washington.	Seattle, Wash.
Hardendorff, Ruth M. A.B., Boston University.	North Amherst.
Harris, Hugh K. B.S., Texas Agricultural and Mechanical College.	Temple, Tex.
Harvey, Harlow W. B.S.Ag., Georgia State College of Agriculture, University of Georgia.	Athens, Ga.
Heald, Jay M. B.S., Massachusetts Agricultural College.	Lincoln.
Hemenway, Justin S. B.S., Massachusetts Agricultural College.	Williamsburg.
Henneberry, Thomas V. B.S., Massachusetts Agricultural College.	Manchester.
Higgins, Rosalind A.B., Middlebury College.	Conway.
Hopkins, Alden B.S., Rhode Island State College.	Chepachet, R. I.
Hutchings, Frank F. B.S., Massachusetts Agricultural College.	New Bedford.
Johnson, Edward D. B.S., University of Maine.	Faneuil.
Johnson, Loyal R. B.S., Colorado Agricultural College.	Monte Vista, Colo.
Kakavas, James C. B.S., Massachusetts Agricultural College.	Amherst.
Kelly, Oliver W. B.S., Colorado Agricultural College.	Fort Collins, Colo.
Kenney, Irene E. A.B., Mt. Holyoke College.	Amherst.
Knudsen, Harold R. B.S., Brigham Young University.	Provo, Utah.
Ladas, Constantine P. B.S., Massachusetts Agricultural College.	Boston.
Landry, Herbert A. B.M.E., School of Engineering, Northeastern University.	West Springfield.
Larsinos, George J. B.S., Massachusetts Agricultural College.	Westfield.
Lindquist, Harry G. B.S., Massachusetts Agricultural College.	Holden.
Lombard, William R. A.B., Colby College.	West Springfield.
Lowry, Wayne J. B.S., Michigan State College.	Midland, Mich.
Lyons, Mary E. B.S., Framingham Normal School.	Holyoke.
MacAloney, Harvey J. B.S., M.F., New York State College of Forestry.	Amherst.
Mackimmie, Alexander A. B.A., Amherst College.	North Amherst.
MacMasters, Majel M. B.S., M.S., Massachusetts Agricultural College.	Collinsville, Conn.
Mayo, William I., Jr. B.S., Massachusetts Agricultural College.	Northampton.
Miller, Mabel A. B.A., Mt. Holyoke College.	Amherst.
Moody, Robert E. B.S., Rutgers College.	Minotola, N. J.
Morgan, Ezra L. A.B., McKendree College. M.A., University of Wisconsin.	Columbia, Mo.
Moriarty, Helen E. B.A., Smith College.	Holyoke.
Morse, Miriam B.S., St. Lawrence University.	New Braintree.
Moseley, Louis H. B.S., Massachusetts Agricultural College.	Glastonbury, Conn.
Nagel, Dorothea M. B.S.E., Salem Normal School.	Northampton.
Nelson, Paul R. B.S., Massachusetts Agricultural College. M.S., Lafayette College.	Holyoke.
Newton, Richard C. B.S., Connecticut Agricultural College.	Middletown, Conn.
O'Brien, Mary C. B.S.E., Normal Art School.	Greenfield.
O'Connell. Margaret M. A.B., New Rochelle College.	Holyoke.
O'Connor, Mary M. A.B., Smith College.	Northampton.
Parsons, Clarence H. B.S., Massachusetts Agricultural College.	North Amherst.
Pettee, Donald A. B.S., University of New Hampshire.	Francestown, N. H.
Plantinga, Oliver S. B.S., Massachusetts Agricultural College.	Amherst.
Plantinga, Sarah T. B.S., Massachusetts Agricultural College.	Amherst.
Putnam, Ernest T. B.S., Massachusetts Agricultural College.	Greenfield.

Rabinowitz, Joseph B.S., Connecticut Agricultural College.	Brooklyn, N. Y.
Reid, Allan H. B.S., Oregon Agricultural College.	Portland, Ore.
Rivnay, Ezekiel B.S., Massachusetts Agricultural College.	Amherst.
Robbins, Zila B.A., Cornell College.	Indianapolis, Ind.
Roberts, Oliver C. B.S., Massachusetts Agricultural College.	Amherst.
Ross, Donald E. B.S., Massachusetts Agricultural College.	Berlin.
Salman, Kenneth A. B.S., Massachusetts Agricultural College.	Needham.
Seymour, Frank C. A.B., Harvard University. B.D., Union Theological Seminary.	North Amherst.
Smith, Noel V. W. B.S., Rhode Island State College.	Northampton.
Smith, Walter R. B.S., Massachusetts Agricultural College.	Holden.
Spear, John A. B.A., Amherst College.	Amherst.
Stitt, Rhea E. B.S., South Dakota State College.	Huron, So. Dak.
Swan, Frederick W. B.S., Massachusetts Agricultural College.	Milton.
Swanback, T. Robert Agronom., Agricultural College of Ultuna, Sweden.	Windsor, Conn.
Thompson, Harold G. B.S., Yale University.	New Haven, Conn.
Tietz, Harrison M. B.S., M.S., Massachusetts Agricultural College.	State College, Pa.
Totman, Ruth J. B.S., New Jersey College.	Conway.
Towne, Carroll A. B.S., Massachusetts Agricultural College.	Amherst.
Tulenko, John T. B.S., Massachusetts Agricultural College.	Sunderland.
Tucker, Edwin L. B.S., Massachusetts Agricultural College.	Baldwinsville.
Turner, Charles E. B.S., Massachusetts Agricultural College.	Springfield.
Van Meter, Ralph A. B.S., Ohio State University.	North Amherst.
Vincent, Clarence C. B.S., M.S., Oregon State Agricultural College. M.S., Cornell University.	Moscow, Ida.
Weeks, Mildred I. A.B., Radcliffe College.	South Gardner.
White, Mildred W. A.B., Connecticut College.	Amherst.
Wildon, Carrick E. B.S., Massachusetts Agricultural College.	Kingston, R. I.
Wilkins, Roland L. B.S., University of Maine.	North Jay, Me.
Wright, David S. A.B., Amherst College.	Northampton.

CLASS OF 1929.

Adams, Harold Sweetnam	Whitinsville	Alpha Gamma Rho.
Adams, Stephen[1]	Easthampton	2 North College.
Alberti, Francis Daniels	Greenfield	16 North College.
Allen, Olive Elizabeth	Flushing, N. Y.	Abigail Adams House.
Arnurius, Armond Lovell	East Orange, N. J.	50 Sunset Avenue.
Bailey, Stanley Fuller	Middleboro	Alpha Gamma Rho.
Barr, Charles Wesley	Pittsburgh, Pa.	Lambda Chi Alpha.
Bartlett, Irene Lawrence	Rowley	Abigail Adams House.
Bertenshaw, Edith Louise	Fall River	Abigail Adams House.
Black, Chesley Leman	Reading	Sigma Phi Epsilon.
Blaisdell, Matthew Louis	North Amherst	North Amherst.
Blomquist, Gustave Stanley	Quincy	Lambda Chi Alpha.
Bond, James Eaton, Jr.	South Lancaster	Alpha Gamma Rho.
Bowie, Robert Lester	East Milton	Q. T. V.
Burgess, Emory Dwight	Melrose Highlands	Phi Sigma Kappa.
Caldwell, Eleanor	Amherst	Care of Prof. Waugh.
Canney, George Gridley	South Hadley	Alpha Sigma Phi.
Carruth, Laurence Adams	Worcester	Fernald Hall.
Chadwick, John Shore	Worcester	Lambda Chi Alpha.
Chapin, Alice Streeter	Sheffield	Abigail Adams House.
Cleaves, Charles Shepley	Gardner	Phi Sigma Kappa.
Copson, Harry Rollason	Easthampton	Q. T. V.
Coukos, Andrew[1]	Lynn	2 North College.
Crowley, Dennis Michael	Boston	4 North College.
Crowley, Francis Jeremiah	Amherst	21 Woodside Avenue.
Davis, Donald Austin	Bedford	21 Fearing Street.
Devine, John Warren	Arlington	Alpha Gamma Rho.
Dutton, George Wallace	Carlisle	Alpha Gamma Rho.

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[1] Candidate for the degree of bachelor of vocational agriculture.

Dyer, Arnold Walton	Falmouth	Theta Chi.
Edson, William Gordon[1]	East Braintree	9 North College.
Egan, William Ambrose, Jr.	Springfield	Sigma Phi Epsilon.
Faulk, Ruth Adelaide	Brockton	Abigail Adams House.
Flint, George Bemis	Lincoln	Q. T. V.
Fonseca, Martin Goodman	Brighton	Farm House.
Fontaine, Mildred	Fall River	Abigail Adams House.
Frost, Charles Austin	Belmont	Phi Sigma Kappa.
Graves, Arthur Hall[1]	Ashfield	Q. T. V.
Hawley, Guila Grey	Westfield	Abigail Adams House.
Hilbert, Alfred George	Chicopee Falls	14 North College.
Hintze, Roger Thomas	Amherst	Aggie Inn.
Holland, Bertram Holbrook	Millis	Q. T. V.
Horan, Timothy Joseph	Whitinsville	Q. T. V.
Howe, Frank Irving, Jr.	Norfolk	Theta Chi.
Hunter, Walter Gordon	South Sudbury	Theta Chi.
Huss, Miriam Hall	Newton Centre	Abigail Adams House.
Isham, Paul Dwight	Hampden	Q. T. V.
Johnson, Alice Luvanne	Holden	Abigail Adams House.
Johnson, Clifton Russell	Worcester	Alpha Gamma Rho.
Jones, Leroy Osgood	Greenfield	Stockbridge Hall.
Kane, Mary Catherine	Holyoke	Abigail Adams House.
Kay, John Reid	Boston	Kappa Sigma.
Kelley, Charles Edward	Dalton	Phi Sigma Kappa.
Kelton, Richard Coolidge	Hubbardston	10 North College.
Kimball, John Adams	Littleton	Lambda Chi Alpha.
Kreienbaum, Roman Albert	Bridgewater	Q. T. V.
Lyman, Warren Hillsgrove[1]	Florence	21 Fearing Street.
Lynch, Elizabeth Anne	Easthampton	Abigail Adams House.
Marsh, Kendall Howe	Holden	Alpha Gamma Rho.
McKittrick, Kenneth Fraser	Boston	Kappa Sigma.
Miller, Donald Raymon	Amherst	158 South Pleasant Street.
Mills, Taylor Mark	Newtonville	Kappa Sigma.
Morrison, Leonard William	Monson	1 North College.
Nash, Robley Wilson	Abington	Kappa Sigma.
Nichols, Edward Holyoke	Montpelier, Vt.	Kappa Sigma.
Nitkiewicz, Boleslaw	Holyoke	Kappa Epsilon.
O'Leary, William Joseph	Northampton	Alpha Sigma Phi.
Packard, Faith Evelyn	Windsor	Abigail Adams House.
Parrish, Ruth Harriet	Great Barrington	Abigail Adams House.
Patch, Eldred Keene	Stoneham	Kappa Sigma.
Patterson, Jane	Amherst	26 Lincoln Avenue.
Pease, Holton Stebbins	Hampden	Theta Chi.
Perkins, Esther Janet	Easthampton	Abigail Adams House.
Perry, Kenneth William	Holliston	Sigma Phi Epsilon.
Plumer, Paul Raymond	Adams	Theta Chi.
Proctor, Harriet Ellise	South Weymouth	Abigail Adams House.
Prouty, Earle Clinton	Monson	Alpha Sigma Phi.
Rees, Robert Drake	Pepperell	Alpha Sigma Phi.
Richardson, Evan Carleton	Millis	Phi Sigma Kappa
Robertson, William Brunner	Port Chester, N. Y.	Phi Sigma Kappa.
Rudquist, Birger John	Boston	Phi Sigma Kappa.
Sargent, Carmeta Elizabeth	Shrewsbury	Abigail Adams House.
Sargent, Leonard Fessenden Everett	Greenfield	12 South College.
Shuman, Ernest Clark	Malden	10 Nutting Avenue.
Sivert, Gladys Elizabeth[1]	Worcester	Abigail Adams House.
Slack, Grace Gertrude	Allston	Abigail Adams House.
Smith, Bessie May	West Somerville	Abigail Adams House.
Snell, Robert Sinclair	Southbridge	East Experiment Station.
Southwick, Walter Edward	Clinton	Kappa Epsilon.
Steere, Phillips Bradley	Chepachet, R. I.	Phi Sigma Kappa.
Steinbugler, Elizabeth Ann	Brooklyn, N. Y.	Abigail Adams House.
Sullivan, John Ayer	Medford	15 South College.
Tarr, Roy Simpson	Gloucester	Theta Chi.
Thayer, Frederick Daniels, Jr.	Shrewsbury	Kappa Sigma.
Tourtellot, Roger Sampson	Providence, R. I.	83 Pleasant Street.
Trevett, Moody Francis	Milford	16 North College.
Vartanian, Dickran	Springfield	11 North College.
Walkden, Charles Edward	Swansea	Q. T. V.
Webber, Dana Otis	Montague	Q. T. V.
Whitten, Russell Rutherford	Melrose Highlands	Lambda Chi Alpha.
Whittle, Doris Evelyn	Worcester	Abigail Adams House.
Williams, Lloyd George	Pittsfield	Kappa Epsilon.
Winton, Alexander Charles	Springfield	Kappa Epsilon.
Woodbury, John Sargent	Fitchburg	9 North College.
Young, Prescott Davenport	North Grafton	Aggie Inn.
Zielinski, John Blaise, Jr.	Holyoke	16 North College.

CLASS OF 1930.

Allen, Herbert Adams	Fitchburg	13 North College.
Allen, Raymond Clayton	Barre	French Hall.
Ames, Winthrop Ashley	Falmouth	Care of J. B. Howard.
Andrew, John Albion, Jr.	West Boxford	Alpha Gamma Rho.
Armstrong, Robert Lindsey	East Sandwich	Sigma Phi Epsilon.
Atwood, Rachel	Greenfield	Abigail Adams House.
Babson, Osman	Gloucester	9 Mt. Pleasant.
Bedford, Harry	Whitinsville	Stockbridge Hall.
Benoit, Edward George	Chicopee Falls	13 North College.
Bergan, Carl Augustus	Northampton	Kappa Sigma.
Berggren, Stina Matilda	Worcester	Abigail Adams House.

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[1] Candidate for the degree of bachelor of vocational agriculture.

Bernard, Sergius Joseph	North Adams	10 South College.
Billings, Samuel Clark	Belmont	5 North College.
Bishop, Frank Millard	Natick	Alpha Sigma Phi.
Bond, Richard Henry, Jr.	Needham	Phi Sigma Kappa.
Bottomly, Bruce Ely	Worcester	12 North College.
Brackley, Floyd Earle	Strong, Me.	Alpha Sigma Phi.
Brown, Mildred Shepard	North Amherst	North Amherst.
Buckler, May Frances	Pittsfield	Abigail Adams House.
Burbank, Oscar Frank, Jr.	Worcester	Phi Sigma Kappa.
Burns, Theodore Chandler	Taunton	Sigma Phi Epsilon.
Call, Reuben Hillman	Colrain	16 South College.
Campbell, Harold Vining	Leyden	3 North College.
Cleveland, Maurice Mortimer	East Pepperell	16 South College.
Cook, Charles Hardy	Beverly	79 Pleasant Street.
Cornelius, Ruth Vera	St. Louis, Mo.	Abigail Adams House.
Coven, Milton Isadore	Springfield	14 South College.
Cox, Adelbert Winters	Framingham	10 South College.
Cox, Charles Bartlett	Boston	Kappa Sigma.
Davis, Gertrude Jordan	Auburndale	Abigail Adams House.
Dean, Lucien Wesley	Millis	Q. T. V.
Decker, Charlotte Marthe	Holyoke	368 Maple Street, Holyoke
Denny, Mertle Althea	Northampton	113 Main Street.
Denton, Edward Wemyss	Boston	26 Fearing Street.
Donovan, Margaret Pauline	Bondsville	Abigail Adams House.
Drew, William Brooks	Greenwich, Conn.	Phi Sigma Kappa.
Ellert, Fred Charles	Holyoke	9 South College.
Elliot, Davis Haskins	South Westport	Sigma Phi Epsilon.
Frame, Charles Frederick	Rockland	8 North College.
Gagliarducci, Anthony Lewis	Springfield	Kappa Epsilon.
Gaumond, Alice Delimen	Southbridge	Abigail Adams House.
Goodell, Herbert Andrew	Southbridge	35 Sunset Avenue.
Goodell, Herman Ulysses	Southbridge	35 Sunset Avenue.
Grunwaldt, Lucy Antoinette	Springfield	Abigail Adams House.
Gunn, Ralph Ellis	South Jacksonville, Fla.	Theta Chi.
Hall, Addison Smith	Ashfield	Phi Sigma Kappa.
Hammond, Clarence Elliot	Needham	Kappa Sigma.
Harris, Charles Whitcomb, Jr.	Leominster	Theta Chi.
Haubenreiser, Elsie Martha	Springfield	Abigail Adams House.
Hayes, Ernest Littlefield	Milton	Q. T. V.
Hernan, Richard Alden	Gilbertville	Q. T. V.
Hetherington, Thomas	Fall River	Sigma Phi Epsilon.
Hinchey, Anne Elizabeth	Palmer	Abigail Adams House.
Howard, John Brooks, Jr.	Reading	Sigma Phi Epsilon.
Howard, Lucius Alexander	Ridgewood, N. J.	Phi Sigma Kappa.
Howard, Martin Stoddard	Northfield, Vt.	Phi Sigma Kappa.
Hunt, Kenneth Whitten	Springfield	Kappa Sigma.
Jensen, Henry Wilhelm	Jamaica Plain	6 North College.
Jones, Fred William	Otis	3 North College.
Joy, John Leo William	Amherst	3 High Street.
Kinney, Asa Foster	South Hadley	Kappa Sigma.
Kneeland, Ralph Folger, Jr.	Attleboro	Alpha Sigma Phi.
Labarge, Robert Rolland	Holyoke	Kappa Epsilon.
Lawlor, John Thomas, Jr.	Marblehead	86 Pleasant Street.
Loud, Miriam Johnson	Plainfield	Abigail Adams House.
Lynds, Lewis Malcolm	Taunton	Sigma Phi. Epsilon.
MacCausland, Mabel Alice	West Newton	Abigail Adams House.
Madden, Archie Hugh	Amherst	42 Lincoln Avenue
Magnuson, Herman Rainville	Manchester	Q. T. V.
Mann, Raymond Simmons	Dalton	Sigma Phi Epsilon.
Manwell, Flora Eleanor	Williamsburg	19 Fearing Street.
Marcus, Theodore	Roxbury	East Experiment Station.
Maylott, Gertrude	Worcester	Abigail Adams House.
Mazzolini, Andrew Robert	Holyoke	517 High St., Holyoke.
McChesney, Herbert Lewis	West Springfield	Kappa Sigma.
McIsaac, Donald Weston [1]	East Weymouth	1 North College.
McKay, Catherine Mary	Newtonville	Abigail Adams House.
Morse, Beryl Florence	Southbridge	Abigail Adams House.
Murphy, Donald Fraser	Lynn	13 Phillips Street.
Nickerson, Ralph Francis	Attleboro	Sigma Phi Epsilon.
Nims, Russell Everett	Greenfield	12 South College.
Pagliaro, Sylvester	Mittineague	Kappa Epsilon.
Paksarian, John Paul	Franklin	Q. T. V.
Phinney, Paul Tirrell	Hyde Park	17 North College.
Phinney, William Roland	Willimansett	Kappa Epsilon.
Pillsbury, William Gale	Amesbury	Theta Chi.
Pollin, Ida Edith	Sheffield	33 Lincoln Avenue.
Pottala, Arne Eric	Fitchburg	6 North College.
Pray, Francis Civille	Amherst	Phi Sigma Kappa.
Purdy, Wilfred George	Amherst	Eames Avenue.
Pyle, Arthur Guard	Plymouth	Theta Chi.
Riley, Vincent Joseph	Somerset	Alpha Sigma Phi.
Robertson, Harold Miner	Leyden	Davenport Inn.
Rudman, Paul Arthur	Agawam	83 Pleasant Street.
Rutan, Huntington	North Hadley	Theta Chi.
Sandstrom, Evelyn Cecelia	Auburn	Abigail Adams House.
Saraceni, Raphael	Lynn	13 Phillips Street.
Sederquist, Arthur Butman, Jr.	Lancaster	Theta Chi.
Singleton, Eric	Brooklyn, N. Y.	Theta Chi.
Skogsberg, Frank Albert [1]	Worcester	Theta Chi.

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[1] Candidate for the degree of bachelor of vocational agriculture.

Smith, Raymond Francis	Needham	Kappa Sigma.
Smith, Winthrop Grant	Needham Heights	Kappa Sigma.
Spooner, Laurence Whipple	Brimfield	President's House.
Stacy, Paul	Webster	Q. T. V.
Stanford, Spencer Clarendon	Rowe	Alpha Sigma Phi.
Stanisiewski, Leon	Amherst	Triangle Street.
Stiles, Alice Goodrich	Westfield	Abigail Adams House.
Stone, Ruth Winifred	Holyoke	Abigail Adams House.
Suher, Maurice	Holyoke	14 South College.
Sullivan, William Nicholas, Jr.	Lawrence	2 North College.
Swift, Gilbert Dean	Melrose	Phi Sigma Kappa.
Taft, Jesse Alderman	Mendon	Phi Sigma Kappa.
Taft, Roger Sherman	Sterling	Alpha Sigma Phi.
Tank, John Richard	Chatham, N. Y.	Sigma Phi Epsilon.
Thatcher, Christine Belle	Cummington	10 Hallock Street.
Tomfohrde, Karl Martin	West Somerville	Theta Chi.
Tompkins, Earle Alexander	Easthampton	Alpha Sigma Phi.
True, Henry Harriman	Haverhill	86 Pleasant Street.
Vaughan, Herbert Sidney	Attleboro	Stockbridge Hall.
Wadleigh, Cecil Herbert	Milford	Phi Sigma Kappa.
Waechter, Peter Hansen, Jr.	Walpole	Lambda Chi Alpha.
White, Frank Tisdale, Jr.	Holbrook	Alpha Sigma Phi.
White, Harold James	Brighton	9 South College.
Williams, Inez Wilhelmenia	Brockton	Abigail Adams House.
Wood, Priscilla Grover	West Bridgewater	Abigail Adams House.
Woodin, Elizabeth Marie	Adams	Abigail Adams House.
Zuger, Albert Peter	New Haven, Conn.	Alpha Sigma Phi.

Class of 1931.

Barrus, George Alvin	Lithia	Clark Hall.
Barry, Elizabeth Evans	Lynn	Abigail Adams House.
Bartlett, Leonard, Jr.	East Walpole	Lambda Chi Alpha.
Bartsch, Nelson Edgar	Waverley	Phi Sigma Kappa.
Beaman, Evelyn Armstrong	Leverett	Abigail Adams House.
Bonney, Walter Twichell	Springfield	54 Lincoln Avenue.
Bosworth, William Ezra, Jr.	Holyoke	14 North College.
Bradley, Sally Elizabeth	Lee	Abigail Adams House.
Brooks, John Hapgood, 3rd	Worcester	46 Pleasant Street.
Brown, Alfred Alexander	Methuen	French Hall.
Buck, Wilbur Francis	Stockbridge	Lambda Chi Alpha.
Burnham, Catharine Annette	Shelburne	Care of A. Taylor, North Amherst.
Burnham, John [1]	Shelburne	8 Allen Street.
Cahoon, Mildred Adeline	Centerville	Abigail Adams House.
Calkin, Lois Lavinia	Concord, N. H.	Abigail Adams House.
Calvi, John	Athol	Colonial Inn.
Carpenter, Henry Dunphe	Bridgewater	Q. T. V.
Chadwick, Alan William.	Worcester	Lambda Chi Alpha.
Chenoweth, Winifred Lee	North Amherst	North Amherst.
Clarkson, Marjorie.	Worcester	Abigail Adams House.
Cucinotta, Lewis Bohlin.	Camden, Me.	Alpha Sigma Phi.
Dangelmayer, Wynton Reid	Waltham	Lambda Chi Alpha.
Daniels, Arthur Richards [2]	Dedham	Q. T. V.
Darling, Herbert Daniel	Allston	Lambda Chi Alpha.
Davis, Arnold Mearns	Berlin	Alpha Gamma Rho.
Davis, George Merrill	South Lee	8 Allen Street.
Davis, Richard William	Melrose	15 North College.
DeFalco, Iris Norma	North Adams	Abigail Adams House.
Digney, Anna Katherine	Dorchester	Abigail Adams House.
Douglass, Frank Taylor	Springfield	Alpha Gamma Rho.
Dover, Evelyn	Methuen	Abigail Adams House.
Evans, Richard Warren	North Attleboro	3 Fearing Street.
Field, George White	Florence.	
Field, Mabel Klose.	Sheffield	Abigail Adams House.
FitzGerald, Paul Richard	Revere	Colonial Inn.
Frey, Newell William	South Hadley Falls	Kappa Epsilon.
Friedrick, Thelma Selene	Florence	Abigail Adams House.
Frost, Edmund Locke	Arlington	Phi Sigma Kappa.
Gallagher, Philip Noel	Cambridge	Baker Place.
Gilgut, Constantine Joseph [2]	Athol	3 Fearing Street
Gold, Harold Kenneth	Holyoke	Granby.
Goodnow, Robert Gibson	Mendon	West Experiment Station.
Goodrich, Raymond Eldred	Amherst	3 South East Street.
Gordon, Jeane	Holyoke	Abigail Adams House.
Gorman, Joseph William	Upton	6 Phillips Street.
Gower, Albert Hugh	Brighton	Kappa Epsilon.
Greene, Nathan Edward	Melrose Highlands	35 Lincoln Avenue.
Griffith, Janet Anne	Wareham	Abigail Adams House.
Guenard, John Robert	Dracut	Sigma Phi Epsilon.
Gula, Joseph John	Bondsville	3 Fearing Street.
Hacker, Walter Breed	Natick	17 Phillips Street.
Hamilton, Stephen Lane	New Salem	Q. T. V.
Hanks, Harry Mason, Jr.	Longmeadow	Phi Sigma Kappa.
Hastings, Emory Barton	Athol	4 Chestnut Street.
Henderson, Everett Spencer	West Hartford, Conn.	Lambda Chi Alpha.
Hickney, Zoe Edwina	Worcester	Abigail Adams House.
Hicks, Murray Ballou	North Adams	Alpha Gamma Rho.

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[1] Candidate for the degree of bachelor of vocational agriculture.
[2] Admitted on probation, entrance record incomplete.

Hines, Francis Martin	Arlington	Alpha Gamma Rho.
Holm, Carl Gustaf [1]	Worcester	2 North College.
Holway, Alfred Harold	Holyoke	134 Northampton Street, Holyoke.
Hoover, Sherman David	Providence, R. I.	Lambda Chi Alpha.
Johnson, Arthur Clement Marriott	Greenfield	11 South College.
Johnson, Erik Alfred	Springfield	Alpha Gamma Rho.
Jones, Lawrence Arthur	Greenfield	11 South College.
Kane, Eugene Joseph	Westfield	Q. T. V.
Kimball Philip Wadsworth	Northboro	5 North College.
King, Kathleen Grace	South Amherst	South Amherst.
King, Marc Nesmith	Waltham	19 Phillips Street.
Kingsbury, Kermit Kenton	Leominster	Theta Chi.
Kitner, William Robert	Westfield	29 North Prospect Street.
Koerber, Margaret Eleanore	Northampton	Abigail Adams House.
Kolonel, Jack Milton	St. John's, Newfoundland	86 Pleasant Street.
Lawrence, John Cheney	Brimfield	President's House.
Lawrence, John Frederick [1]	Brimfield	4 Chestnut Street.
LeClair, Gertrude Leah	Southbridge	Abigail Adams House.
Little, Charles Lunt	West Medford	15 South College.
Loar, Russell Dudley	Springfield	42 Lincoln Avenue.
Loomis, Randall Miller	Easthampton	22 Pleasant Street, Easthampton.
Lorrey, Robert Henry	Watertown	11 South College.
Lyman, Evelyn May	East Longmeadow	Abigail Adams House.
Mackimmie, George Ross	North Amherst	North Amherst.
Manty, Charles Weikko	Maynard	Lambda Chi Alpha.
Marshall, Mary Moore	Whitinsville	Abigail Adams House.
Mason, Frank Ford, Jr.	Pownal, Vt.	West Experiment Station.
McGuckian, John William	Boston	Q. T. V.
McKeen, Richard Potter	Watertown	Q. T. V.
Mead, Gertrude Alice	Townsend	Abigail Adams House.
Meyer, Beatrice Florentine	Amherst	Potwin Lane.
Minkstein, Thomas Edward	Westfield	Q. T. V.
Monk, Marjorie	Watertown	Abigail Adams House.
Morawski, Earle Leo	Attleboro	120 Pleasant Street.
Morgan, Isabel Elvira	Schenectady, N. Y.	44 Triangle Street.
Myrick, Norman	Longmeadow	101 Pleasant Street.
Nash, Albert, Jr. [1]	Greenfield	M. A. C. Farm Bungalow.
Nash, Clyde Woodbury	Haverhill	83 Pleasant Street.
Nason, David Mitchell	Medford	Kappa Sigma.
Nelson, Harmon Oscar, Jr.	Whitinsville	12 North College.
Norell, Frieda Brita	Amherst	Mt. Pleasant.
Northcott, John Warren, Jr.	New Bedford	Alpha Gamma Rho.
Nott, George Edwin	Brookfield	10 North College.
Oliver, George West	Watertown	15 North College.
Olsson, Arnold William	Brockton	Lambda Chi Alpha.
Paulson, John Edward	Holyoke	Kappa Epsilon.
Pierce, Gertrude Keith	Shelburne Falls	Abigail Adams House.
Pierce, Ralph Eugene, Jr.	Newton	15 North College.
Plantinga, Martin Peter	Amherst	18 North East Street.
Potter, Rial Strickland, Jr.	Springfield	Sigma Phi Epsilon.
Powers, John Joseph	Framingham	86 Pleasant Street.
Priest, Arthur George	Windsor, Conn.	Care of Mr. Everson.
Pyenson, Louis	East Lee	13 South College.
Reuter, Anna-May	Northfield	Care of Dr. Chamberlain.
Ronka, Lauri Samuel	Gloucester	7 North College.
Rooney, Robert Colbert	Reading	Care of Mr. Carey.
Roper, Marion Isabel	Westminster	Abigail Adams House.
Rubin, Theodore	Brooklyn, N. Y.	13 South College.
Runvik, Kenneth Carl	Detroit, Mich.	Kappa Epsilon.
Russell, Grace Shirley	Easthampton	Abigail Adams House.
Salenius, Charles Henry	Hingham	97 Pleasant Street.
Sandow, John Ellenwood	Natick	5 North College.
Scott, Ruth Elizabeth	North Hadley	North Hadley.
Sears, Louis Alf	Ashby	Theta Chi.
Shaw, Frank Robert	Belchertown	Belchertown.
Shepard, Laurence Moody [1]	West Boylston	Theta Chi.
Smith, Ernest Gordon	Medford	Phi Sigma Kappa.
Smith, Paul Augustus	Malden	15 South College.
Somes, John	Otis	Eames Avenue.
Spiewak, Pauline Anna	Holyoke	Abigail Adams House.
Stevenson, Errol Burton	Brockton	Stockbridge Hall.
Stoddard, Herbert Tilden	Cohasset	101 Pleasant Street.
Stuart, Robert Emerson	Littleton	66 Lincoln Avenue.
Takahashi, Leopold Hanzo	Amherst	Pelham Road.
Tashjian, Louren Markar	Amherst	101 Pleasant Street.
Tiffany, Don Cecil	Cambridge	17 North College.
Troy, Frederick Sherman	Arlington	Alpha Gamma Rho.
Tucker, Robert Barclay	Boston	17 Kellogg Avenue.
Upton, Shirley	North Reading	Abigail Adams House.
Vichules, Marguerite Veronica	Northampton	7 Maple Street, Northampton.
Vincent, Lionel Lewis	Westminster	M. A. C. Farm House.
Wahlgren, Hardy Lewis	Melrose	94 Pleasant Street.
Warren, Allen Johnson	New Haven, Conn.	Theta Chi.
West, Allen Sherman, Jr.	Springfield	Kappa Sigma.
Westendarp, Edwin Maurice	Saugus	83 Pleasant Street.
Wherity, Richard White	Scituate	Alpha Sigma Phi.

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[1] Candidate for the degree of bachelor of vocational agriculture.

White, Edwin Theron	Millbury	17 Phillips Street.
Whittum, Frederick Kingsley	Springfield	Kappa Sigma.
Wilbur, Benjamin	Woburn	Q. T. V.
Woods, James Joseph, Jr.	Leominster	Alpha Gamma Rho.
Yeatman, Alwyn Frederick	Springfield	3 Hallock Street.

Class of 1932.

Aldrich, George Elliott	Northampton	333 Prospect Street, Northampton.
Anderson, Carrolle Elizabeth	Ashfield	Ashfield.
Anderson, Mabelle Lydia	Southwick	Abigail Adams House.
Astore, John Joseph	Stockbridge	31 North Prospect Street.
Baker, Cyrus Franklin	South Chatham	15 Fearing Street.
Baker, Walter Connor	Franklin	15 Phillips Street.
Barber, Charles Heyworth	Peru, N. Y.	18 Nutting Avenue.
Bates, Lewis Edward[1]	Ashfield	18 Nutting Avenue.
Bates, Richard Roy	Lynn	58 Main Street.
Batstone, William Frank	West Newton	21 Fearing Street.
Betts, Benjamin Davenport	Norwalk, Conn.	44 Sunset Avenue.
Bishop, Herbert Lorimer, Jr.[2]	Worcester	27 Fearing Street.
Black, Mary Egesta	Williamsburg	25 Fearing Street.
Boland, Katherine	Dracut	Abigail Adams House.
Bonney, Kenneth Freese	Walpole	83 Pleasant Street.
Boston, Margaret Mary	Hyannis	Abigail Adams House.
Braun, Leo Herbert	Millis	18 Nutting Avenue.
Bray, Abner Dawson	Holyoke	16 North Prospect Street.
Brown, Arthur Endicott	Wayland	M. A. C. Farm House.
Brown, Thurl Dryden	Danvers	86 Pleasant Street.
Bunten, John Frederick	Brockton	29 North Prospect Street.
Burke, William James, Jr.	Holyoke	10 Hallock Street.
Burrington, John Cecil, Jr.	Charlemont	Care of Mr. Carter, West Street.
Cain, George Herbert	South Braintree	Baker Place.
Caird, Wynne Eleanor	Dalton	Abigail Adams House.
Carter, Forrest Edward[1]	Wakefield	9 Fearing Street.
Chapman, Kenneth William	Springfield	M. A. C. Farm House.
Chart, Stanley	Dorchester	56 Pleasant Street.
Chase, Herbert Manton, Jr.	Newport, R. I.	29 North Prospect Street.
Cheney, Howard Alton	Springfield	83 Pleasant Street.
Church, Gertrude Barber	North Amherst	North Amherst.
Clark, Webster Kimball, Jr.	West Deerfield	17 Phillips Street.
Cohen, William	Springfield	19 Phillips Street.
Connell, Philip Joseph	Springfield	97 Pleasant Street.
Cooley, Laura Grace	Sunderland	Sunderland.
Cossar, Hollis Ford	North Sudbury	86 Pleasant Street.
Costanzo, Louis Paul	Stamford, Conn.	81 Pleasant Street.
Costello, John Paul	Franklin	31 Cottage Street.
Cox, Frederick Elliot	Jamaica Plain	Kappa Sigma.
Crawford, Forrest Emerson[2]	Waverley	8 Nutting Avenue.
Daley, Robert Daniel	Arlington	Colonial Inn.
Davis, Henry Demond	Boston	Davenport Inn.
Davis, William Proud	Waltham	4 Nutting Avenue.
Dean, Merritt	North Pownal, Vt.	13 Fearing Street.
De Gelleke, Peter	Troy Hills, N. J.	15 Phillips Street.
Delisle, Albert Lorenzo	South Hadley Falls	453 Newton Street, South Hadley Falls.
Dickinson, Thelma Louise	Greenwich	Abigail Adams House.
Diggs, Robert Lewis	Brighton	81 Pleasant Street.
Dobbins, Wilbur[2]	Burlington	83 Pleasant Street.
Dods, Agnes Miriam	Leverett	Leverett.
Doerpholz, Eunice Minerva	Belchertown	Abigail Adams House.
Donaghy, Edward Joseph[2]	New Bedford	4 North College.
Doyle, James Edward	Northampton	86 Pleasant Street.
Dunn, Albert Carleton	Acton	10 McClellan Street.
Durkee, Pauline Agnes[2]	Amherst	120 Pleasant Street.
Dyar, George Wellington	Waltham	4 Chestnut Street.
Edmond, Stuart Deane	Amherst	8 South Prospect St.
Edwards, Donald Graham	Morgantown, W. Va.	44 Sunset Avenue.
Efimchenko, Basil Matthew	Russia	56 Pleasant Street.
Eldredge, Josephine	Chatham	Abigail Adams House.
Eldridge, Richard Albert	South Chatham	15 Fearing Street.
Everson, Bettina Lowell	Amherst	North Pleasant Street.
Fabyan, Warren White[1]	East Weymouth	9 Phillips Street.
Fannin, Nancy Sarilda	Phoenix, Ariz.	24 Dana Street.
Fell, James Edward	Fall River	27 Fearing Street.
Fish, Ozro Meacham, Jr.	Waltham	45 Fearing Street.
Fisher, William Sidney, Jr.	Mt. Ephraim, N. J.	Poultry Plant.
Flavin, Edward Michael	Greenfield	45 Fearing Street.
Fletcher, Robert Bliss	Worcester	17 Phillips Street.
Flood, George Millard	North Adams	83 Pleasant Street.
Foley, John Joseph	Amherst	83 Pleasant Street.
Folger, Richard Sloan	Roslindale	22 Fearing Street.
Fontaine, Arthur Lewis	Fall River	86 Pleasant Street.
Forest, Herbert Leon	Arlington	Eames Avenue.
Forrest, Angeline West	Provincetown	Abigail Adams House.
Foskett, Clifford Robert[1]	East Weymouth	8 Allen Street.
Fraser, Richard Arthur	Lowell	83 Pleasant Street.
Gagliarducci, Vincent Nicholas	Springfield	Colonial Inn.

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[1] Candidate for the degree of bachelor of vocational agriculture.
[2] Admitted on probation, entrance record incomplete.

Garvey, Jerome John [2]	Holyoke	16 North Prospect Street.
Gerrard, Barbara Kimball	Holyoke	Abigail Adams House.
Goodall, Leslie Duncan	Winthrop	75 Pleasant Street.
Goodell, Bertram Cheney	Southbridge	57 Lincoln Avenue.
Goodwin, Azor Orne	Marblehead	9 Phillips Street.
Gordon, Laura Elizabeth	Ipswich	Abigail Adams House.
Gorey, Robert Francis	South Deerfield	South Deerfield.
Grayson, William Ralph	Milford	Alpha Sigma Phi.
Gunness, Robert Charles	Amherst	105 Butterfield Terrace.
Hale, Kenneth Fowler	Tolland	84 Pleasant Street.
Hale, Lois Maverette	Greenfield	Abigail Adams House.
Hale, Nathan Shirley [1]	Rowley	86 Pleasant Street.
Hall, Ernest Stephen [1]	Worcester	Baker Place.
Halzubic, Henry	North Andover	12 Chestnut Street.
Hamilton, Ormond	Brookfield	23 Cottage Street.
Hatch, Helen Marguerite	West Newton	Abigail Adams House.
Haynes, Arnold Calvin	Springfield	13 Phillips Street.
Hersam, Alfredda Reuben	Stoneham	Eames Avenue.
Hickson, Edward Charles	Westfield	8 Allen Street.
Hitchcock, John David	West Medway	21 Fearing Street.
Hodge, Kenneth Elba	Monson	84 Pleasant Street.
Hoffman, Mildred Flora	Lawrence	Care of Mr. Burnett, Mt. Pleasant.
Holder, Eben Daniel [2]	Hudson	Flint Laboratory.
Holmberg, Oscar Edward	Waltham	Lambda Chi Alpha.
Howe, Elizabeth Vose	South Acton	Abigail Adams House.
Howe, Evan Carleton	Norfolk	22 Fearing Street.
Howlett, Carey Harris	Southampton	22 Fearing Street.
Hubbard, Catherine Newton	Sunderland	Abigail Adams House.
Humphreys, Grace Augusta	Westfield	26 Dana Street.
Hunter, Marion Brockway	Holyoke	Abigail Adams House.
Isham, Beatrice Catherine	Ludlow	Care of Mrs. H. Hobart, North Amherst.
Izzi, Emil	South Barre	1 Cottage Street.
Johnson, William Andrew	Haverhill	10 Nutting Avenue.
Jorczak, Joseph Stanley	Chicopee	5 East Pleasant Street.
Kaylor, John Daniel	Fall River	86 Pleasant Street.
Keyes, Curtis Gilbert	Whitinsville	15 Phillips Street.
Killeen, John Bernard, Jr.[2]	Cambridge	81 Pleasant Street.
King, George Lester [2]	Methuen	4 Chestnut Street.
Lake, Susan Glidden	Plainville	Abigail Adams House.
Lamb, Francis Bleakie	White Plains, N. Y.	Phi Sigma Kappa.
Lawrence, Edwina Frances	Springfield	Abigail Adams House.
Lepie, Joseph Edward [2]	Dorchester	56 Pleasant Street.
Levine, Anna	Holyoke	Abigail Adams House.
Levine, Harry	Springfield	13 South College.
Libbey, William Clinton	Westboro	15 Fearing Street.
Loomer, Edward Alfred	Abington	Kappa Sigma.
Lyons, John Carleton [2]	Putney, Vt.	17 Kellogg Avenue.
MacLean, John Douglas	West Bridgewater	51 Amity Street.
Mamaqui, Nusret Osman	Albania	Eames Avenue.
Margolin, Oscar	Newtonville	22 Fearing Street.
Markus, Christine Veronica	Monson	Abigail Adams House.
Martin, John Graham	Springfield	8 Allen Street.
Mason, Donald Mowatt	South Easton	13 Phillips Street.
McBride, Lawrence Sylvester	Watertown	Eames Avenue.
Merritt, Orris Elma	Sheffield	Abigail Adams House.
Merritt, Richard Hyde	Williamsburg	62 Pleasant Street.
Miller, Frank Edward, Jr.	Lynn	51 Amity Street.
Mitchell, Ernest Wilson, Jr.	Newburyport	31 East Pleasant Street.
Mitchell, Robert Dawson	Holyoke	18 Nutting Avenue.
Morgan, Lillian Mae [2]	Dunstable	Abigail Adams House.
Morrison, Florence Lee	Williamstown	Abigail Adams House.
Murphy, Edward William	Holyoke	Alpha Sigma Phi.
O'Connor, Thomas Patrick	Holyoke	3 Nutting Avenue.
O'Donnell, Patrick Edward	North Abington	45 Fearing Street.
Ohlwiler, Margaret Amelia	Southbridge	Abigail Adams House.
Oliver, Thomas Joseph	Gloucester	8 Nutting Avenue.
Osgood, Gregory Victor	Everett	97 Pleasant Street.
Parker, William Hooper	Gorham, Me.	Lambda Chi Alpha.
Parsons, Anna Thankful	Southampton	Abigail Adams House.
Peck, Hazel Bernice	Springfield	Abigail Adams House.
Pollard, Robert Lonsdale	North Adams	Care of H. M. Gore.
Pollin, Lillian Pauline	Sheffield	33 Lincoln Avenue.
Post, Kenneth Eugene	Marlboro	Care of E. Gaskill.
Prince, Carlton Gordon	Adams	75 Pleasant Street.
Purdy, Harris Henry [2]	Amherst	Eames Avenue.
Reed, Elizabeth Ruth	Dalton	Abigail Adams House.
Reed, Virginia	Waltham	Abigail Adams House.
Rhoades, Olive	Williamsburg	Abigail Adams House.
Rice, Clara Ruth	Charlemont	Abigail Adams House.
Rice, George Comerford	Needham	15 Fearing Street.
Rivkin, Julius Meyer	Chelsea	56 Pleasant Street.
Roach, Douglas Bryan	Provincetown	24 McClellan Street.
Roffey, Robert Cameron	Rockport	Davenport Inn.
Rollins, Emily Gerrish	Jamaica Plain	Abigail Adams House.
Ronka, George Raphael	Gloucester	7 North College.
Rowley, Richard Andrew	Holyoke	81 Pleasant Street.

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[1] Candidate for the degree of bachelor of vocational agriculture.
[2] Admitted on probation, entrance record incomplete.

Ryan, John Bartlett, Jr.	Swampscott	10 Nutting Avenue.
Saffer, Ralph Michel [2]	Springfield	86 Pleasant Street.
Sala, Americo Peter	Lee	31 North Prospect Street.
Salisbury, Alston Moore	Melrose Highlands	26 Fearing Street.
Salo, Victor Vickko [2]	Millbury	17 Phillips Street.
Salter, Leonard Austin, Jr.	Springfield	97 Pleasant Street.
Samoriski, Edward Victor	Millers Falls	4 Chestnut Street.
Schoonmaker, John Warder	South Amherst	R. F. D. Amherst.
Shea, William Roger	Ware	22 Fearing Street.
Smart, Harry Hall	Waltham	18 Nutting Avenue.
Smith, Aleck	Everett	Care of Mr. Carey, North Pleasant Street.
Smith, Arthur Willard	Northampton	27 Fearing Street.
Smith, George Gilman	Lebanon, N. H.	97 Pleasant Street.
Smith, Roland Whipple	South Hamilton	5 East Pleasant Street.
Soja, Stephen Stanley	North Wilbraham	42 Cottage Street.
Springer, Frank Leslie	Arlington	97 Pleasant Street.
Stiles, Robert Edward	Amherst	122 West Street.
Storey, Carl Herbert	Springfield	83 Pleasant Street.
Stuart, Wallace Wyman	Littleton Common	66 Lincoln Avenue.
Sylvester, George Stull	Glen Rock, N. J.	7 Phillips Street.
Taylor, Avis Ruth	Dedham	Abigail Adams House.
Taylor, Clarisse Marie	Lee	Abigail Adams House.
Taylor, Fred Herbert	Groton	10 Nutting Avenue.
Teague, Lynwood Patterson [1]	North Weymouth	9 Phillips Street.
Tetro, Robert Carl	Williamsburg	Alpha Gamma Rho.
Thomas, Edwin Henry	Attleboro	10 South College.
Thompson, Elmer Joseph	Brookline	83 Pleasant Street.
Tikofski, John William	Walpole	22 Fearing Street.
Tippo, Oswald	Jamaica Plain	4 North College.
Towle, Gifford Hoag [2]	Holden	31 North Prospect Street.
Tupper, Deane Rowe	Orange	Sigma Phi Epsilon.
Twiss, Mildred Florence	Hudson	Abigail Adams House.
Utley, Walter Sampson	Chesterfield	35 Lincoln Avenue.
Van Leer, Hans Lodewijk	Hilversum, Holland	13 Phillips Street.
Vendt, Eric Clifton [1]	Worcester	6 Baker Place.
Vik, John Henry [2]	Wakefield	9 Fearing Street.
Voorneveld, William, Jr.	Nantucket	Davenport.
Waite, Harold Vita Montefiore	Northampton	Lambda Chi Alpha.
Wanegar, Melvin Harold	Montague City	5 East Pleasant Street.
Warner, Lulu Harriet	Amherst	Shay Street.
Warren, Philip Wallis	West Auburn	27 Fearing Street.
Waskiewicz, Edward Julian	Three Rivers	56 Pleasant Street.
Watson, Edward Winslow	Plymouth	81 Pleasant Street.
Watson, Philip Sagendorph	Arlington	66 Pleasant Street.
Wear, William Homer	Waltham	4 Nutting Avenue.
Webb, Pauline Alice	Swift River	50 Main Street.
Welch, Frederick Joseph	North Abington	45 Fearing Street.
Wendell, Charles Butler, Jr.	Belmont	75 Pleasant Street.
Wetterlow, Eric Hilding, Jr.	Manchester	6 Phillips Street.
Wheeler, Kenneth Monroe	Great Barrington	East Pleasant Street.
Whitten, Gilbert Yould	Melrose	94 Pleasant Street.
Wilson, James Louis	Ashland	56 Pleasant Street.
Wilson, Robert Alexander	Lowell	44 Sunset Avenue.
Wright, Vera Isabelle	Northfield	Abigail Adams House.

SPECIAL STUDENTS.

Parent, Herbert Harvey	Springfield.	
Pinnick, Edith Leone	Amherst	Inwood.
Poggi, Vera Frances	New York, N. Y.	116 North Pleasant Street.

REGISTERED AFTER CATALOGUE FOR 1927–28 WAS PUBLISHED.

1928.

Anderson, Andrew Bremer . . . . Hudson.

1931.

Potter, Stuart Hamilton . . . . Framingham.

SUMMARY BY CLASSES.

CLASS.	Men.	Women.	Total.
1929	82	23	105
1930	100	27	127
1931	114	34	148
1932	170	48	218
Specials	1	2	3
Totals	467	134	601

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[1] Candidate for the degree of bachelor of vocational agriculture.

[2] Admitted on probation, entrance record incomplete.

Geographical Summary.

Massachusetts	555	West Virginia	1
Maine	3	Michigan	1
New Hampshire	2	Missouri	1
Vermont	5	Arizona	1
Rhode Island	4	New Foundland	1
Connecticut	7	Albania	1
New York	10	Holland	1
New Jersey	5	Russia	1
Pennsylvania	1		
Florida	1	Total	601

STOCKBRIDGE SCHOOL OF AGRICULTURE.

Graduates, 1928.

Richard Varnum Ashton	Ipswich.
Daniel Wallace Baker	Allston.
Alden Chester Ballard	North Adams.
Warren Arthur Batchelor	Stoughton.
Leroy Leonard Bergman	Orange.
Bradford Henry Butler	Feeding Hills.
Alden William Butters	Natick.
Eileen Mary Callahan	Dorchester.
Errol Francis Cook	Waltham.
Arthur Desmond Crowell	Brewster.
Eber Hammond Davis	Rutland, Vt.
John Bradford Dennett	Plympton.
John Joseph Doherty	Woburn.
Eunice Constance Eldredge	Chatham.
Richard Daniel Finerty	Waban.
Ludwig Hoffman	Rockville, Conn.
Stuart Woodbury Hovey	Dracut.
Lloyd Wendell Jewett	Middlebury, Vt.
Erling Christian Johnson	Everett.
Charles Goodrich Kellogg	Benson, Vt.
George Warren Kimball	Westwood.
Ruth Edwina Larned	Amherst.
Carl Philip Larson	Hampden.
Harry Leroy Lawson	Brockton.
Thomas Wing Lawson	North Dartmouth.
Frank Luce Lopes	Vineyard Haven.
John Wesley MacIntyre	Springfield.
Lewis Henry Maddocks, Jr.	Lowell.
John Chesley Marchant	Boston.
Harold Edmunds Mayberry	Northborough.
Ira Joel Mitchell	Haverhill.
Samuel Stetson Mitchell	Salem.
Thomas Napoli	Lexington
Sidney Parkhurst Nelson	Jamaica Plain.
Ralph Edwin Olsen	Waverley.
Andrew Stephen Pazsit	Mansfield.
Bradley Huston Petersen	Worcester.
Frank Willard Poskitt	Westborough.
Harold Charles Prentiss	Hubbardston.
Robert Edward Puffer.	Saugus.
Howard George Pulsifer	Natick.
Henry Victor Rabouin	Windsor.
Alice Ravenia Randall	Belchertown.
John Cheney Ripley	South Weymouth.
Gerald Brendon Roche	Charlestown.
George John Rommell, Jr.	Dorchester.
Alan Douglas Stackpole	South Hadley.
Oscar Allan Starkweather	Needham.
Cecil Gordon Stockwell	Grafton.
Dwight Kenneth Stowell	New Salem.
Herbert Allston Wetmore	Worcester.
Philip Alan Wilcox	Windsor, Vt.
Giles Hyman Willey	Essex Junction, Vt.
Eleanor King Winkler	Wakefield.
Francis Deane Wood	Belfast, Me.
Alfred Herbert Woodcock	Daytona Beach, Fla.
Harold Frank Wyman	Leominster.
Frank Joseph Yarrows	Hatfield.

Class of 1929.

Aseltine, Merritt Lester, Jr.	Mittineague	18 Cottage Street.
Ashworth, Servetus Thomas, Jr.	Westboro	23 Cottage Street.
Barnes, Howard W.	Roslindale	Kolony Klub.
Baxter, Joseph Chisholm	Dorchester	47 Eames Avenue.
Beals, George Chelsea	New Britain, Conn.	A. T. G., No. College.
Belden, Allen Montgomery, Jr.	Springfield	13 Hallock Street.
Belden, Elbridge Francis	Woburn	Kolony Klub.
Blackinton, Russell Pentecost, Jr.	Chepachet	A. T. G., No. College.
Blackwell, Arthur Ramsdale.	Wellesley Hills	A. T. G., No. College.
Boothby, Lloyd Meserve	Randolph	Kolony Klub.
Brackley, Kenneth Malcolm	Strong, Me.	101 Pleasant Street.
Braun, Robert	Holliston	14 McClellan Street.

Brown, James Francis	Lowell	31 Cottage Street.
Brown, William Francis	Marblehead	Tillson Court.
Brown, Winsor Cargill	North Attleboro	A. T. G., No. College.
Chace, William Stuart	Dartmouth	A. T. G., No. College.
Cheney, Oliver Franklin	Framingham	A. T. G., No. College.
Clarke, Raymond Davenport	Brimfield	No. Amherst, Care of Mr. Archibald.
Cottrell, Merton Ashley	Middlefield	Kolony Klub.
Coutu, Wilfred Louis	North Cambridge	31 Cottage Street.
Crissman, Joseph Robinson	Punxsutawney, Pa.	86 Pleasant Street.
Crowley, Denis, Jr.	Quincy	Hillside Avenue.
Dibble, Lysleford Arthur	Wilbraham	A. T. G., No. College.
Dillaway, Clara Louise	Newton Highlands	Abigail Adams House.
Doane, Clifford Walen	Manchester	A. T. G., No. College.
Eldredge, Keith Graham	Sagamore	42 McClellan Street.
Englemann, Harold M.	Pittsfield	Kolony Klub.
Ewart, Thomas Lewis	Newton Highlands	Kolony Klub.
Eyberse, John Martin	Manchester	A. T. G., No. College.
Fahey, Lawrence James	Easthampton	Easthampton.
Fay, Edward Thomas	Dorchester	Hillside Avenue.
Flavin, Charles Joseph	Whately	Kolony Klub.
Fleming, James Delbert	Ashland, N. H.	Kolony Klub.
Fletcher, Charles Wilfred	Rehoboth	Baker Lane, Care of Mrs. Webb.
Franklin, Paul Lawrence	Springfield	3 Nutting Avenue.
French, William Brown	Granby	14 McClellan Street.
Fuller, Albert Henry	Ludlow	A. T. G., No. College.
Gale, John Harper	Tewksbury	76 Pleasant Street.
Gallagher, Edward Francis	Lenox	Kolony Klub.
Gillis, Archie James, Jr.	Manchester	Kolony Klub.
Gorham, Edward Francis	South Braintree	Eames Avenue.
Graf, Henry, Jr.	Newburyport	A. T. G., No. College.
Graham, Herbert Walker	Marlboro	A. T. G., No. College.
Graves, Kenneth Batchelder	Conway	Kolony Klub.
Greene, Albert Melville	Ashland	A. T. G., No. College.
Hall, Bertrand Augustus	Amherst	24 McClellan Street.
Hall, John Woodbury	Ballard Vale	A. T. G., No. College.
Hartness, Henry John	Sutton	18 Nutting Avenue.
Hempel, Edward Charles, Jr.	Blackstone	Baker Lane.
Hermann, William Tolle	Harvard	50 Main Street.
Herrick, Carl	Amherst	43 Sunset Avenue.
Hero, George Wilmarth	Westboro	23 Cottage Street.
Herron, Margaret	Greenfield	Abigail Adams House.
Hobart, Edward Pickering	Duxbury	A. T. G., No. College.
Hoyt, Herman Francis	Newton	A. T. G., No. College.
Hulbert, Gordon Chesley	Holliston	A. T. G., No. College.
Joslin, Elliott Procter	Oxford	46 Pleasant Street.
Kelley, Paul Haynes	Orange	A. T. G., No. College.
Kendrick, Earl Spencer	Everett	Kolony Klub.
King, Lewis Emery	North Brookfield	54 Lincoln Avenue.
Leland, Robert Arthur	East Bridgewater	40 Sunset Avenue.
Lincoln, George Thomas	Barre	108 Pleasant Street.
Lyman, Donald Burt	Westhampton	4 Hallock Street.
Masciocchi, Emilio Anthony	Roxbury	47 Eames Avenue.
Mayo, Walter Howard	East Orleans	7 McClellan Street.
McCarthy, George William	Northampton	Northampton.
McConvill, William	New Bedford	50 Sunset Avenue.
McIntire, William Wilson	Lowell	13 Hallock Street.
Mongillo, Frank Anthony	Southington, Conn.	A. T. G., No. College.
Noble, Leon Holcomb	East Hartford, Conn.	Eames Avenue.
Osgood, Gardner Seabury	North Dartmouth	7 McClellan Street.
Parker, Carl Irving	South Lancaster	Kolony Klub.
Parkinson, Leonard Raymond	Springfield	101 Pleasant Street.
Parks, Stillman Harding	Gloucester	50 Main Street.
Perkins, Frank Redick	Lexington	9 Fearing Street.
Phelps, Noel Cornell	Lexington	9 Fearing Street.
Philbrick, Richard Staigg	Woburn	8 Kellogg Avenue.
Pratt, Clarence Albert	Bernardston	31 No. Prospect Street.
Quick, Harry Dumont	Dighton	Baker Lane, Care of Mrs. Webb.
Robison, William Edward, Jr.	Holyoke	3 Hallock Street.
Roundy, Glenn Hay	North Billerica	8 Kellogg Avenue.
Russo, Nicholas Belmont	Fitchburg	Hillside Avenue.
Sherburne, Frances	Concord	Abigail Adams House.
Sherman, Richard Morse	Southbridge	4 Mt. Pleasant.
Skovron, Peter	Newburyport	A. T. G., No. College.
Smith, Austin James	South Londonderry, Vt.	31 No. Prospect Street.
Smith, John Francis	Westboro	10 McClellan Street.
Snell, Alwyn Gayner	Brockton	108 Pleasant Street.
Stearns, George Irvin	Carlisle	42 McClellan Street.
Stevens, Clarence Eugene	Marlboro	A. T. G., No. College.
Stevens, Thornton	Norwood	McClure Street.
Sullivan, Agnes Nora	Palmer	Abigail Adams House.
Sullivan, John Joseph	Salem	75 Pleasant Street.
Sylvia, Joseph Frates	Mattapoisett	3 McClure Street.
Townsend, Donald Francis	Salem	Kolony Klub.
Van Norman, Louis Edwin, Jr.	Washington, D. C.	19 Main Street.
Warren, Milton Franklin	New Bedford	Care of E. E. Stiles, So. Amherst.
Webb, George Nelson	Stonington, Me.	17 Kellogg Avenue.
Weston, Gordon Worth	Cambridge	31 Cottage Street.

Whelan, Howard A.	Brookline	75 Pleasant Street.
White, Kenneth Baker	West Hawley	4 Hallock Street.
Witherell, William Clayton	Taunton	Kolony Klub.
Witt, Louis A.	North Brookfield	61 Amity Street.
Woodger, James Henry	Sheffield	A. T. G., No. College.
York, James Oswald	New Bedford	Baker Lane, Care of Mrs. Webb.
Young, Robert Augustus	Norton	18 Cottage Street.

CLASS OF 1930.

Anderson, Irving Wood	Stoneham	66 Lincoln Avenue.
Anderson, Philip Guston	Ashland	33 Cottage Street.
Arnott, William Henry	Fitchburg	47 Eames Ave.
Avery, Willard Wendell	East Kingston, N. H.	13 Hallock Street.
Bailey, Harold Frederick	Southboro	67 Pleasant Street.
Bancroft, Floyd Upton	Tyngsboro	23 Woodside Avenue.
Barbey, John	Amherst	73A East Pleasant Street.
Barr, Richmond Cushman	Worcester	Baker Lane, Care of Mrs. Webb.
Baummer, Albert Harry	Naugatuck, Conn.	Box 36, North Amherst.
Beaumont, Mary	Saxonville	Abigail Adams House.
Becker, Charles Young	Westport, Conn.	13 Hallock Street.
Bolles, Edgar Stanley, Jr.	Monument Beach	42 McCelllen Street.
Bower, William Critchley	Methuen	47 Eames Avenue.
Brainard, Floretta Ten Broeck	West Springfield	34 Amity Street.
Brookings, Eugene Sturgis	West Newton	29 Lincoln Avenue.
Brown, Ralph Leonard	Portsmouth, N. H.	33 Northampton Road.
Burnham, Walter James	Winchendon	46 McClellan Street.
Butler, Edward William	Holyoke	Baker Lane, Care of Mrs. Webb.
Byron, John S.	Hadley.	
Caldwell, Sanborn Ames	Lynnfield	Hillside Avenue.
Carlon, John Joseph	Northampton	Northampton.
Caswell, Richard Burrell	Lakeville	50 Sunset Avenue.
Chadwick, Richard Poor	West Boxford	47 Eames Avenue.
Chapin, Samuel Clarence	East Longmeadow	21 Woodside Avenue.
Clark, Chandler	Brockton	1 Cottage Street.
Cleary, Joseph Robert	Lynn	23 Woodside Avenue.
Constain, Marco	Papayan, Cauca, Colombia	62 Pleasant Street.
Couture, Herman	Belchertown	Belchertown.
Coyle, Joseph Henry	Somerville	5 Woodside Avenue.
Crane, Alfred Sumner	Springfield	108 Pleasant Street.
Crockett, Eldridge	Arlington	5 Woodside Avenue.
Crockett, Elmer Matthews	Rockport, Me.	15 Cottage Street.
Curran, James Henry	Danvers	67 Pleasant Street.
Curran, Thomas Edward	Danvers	67 Pleasant Street.
Cutrumbes, Arthur John	Dracut	Baker Lane, Care of Mrs. Webb.
Derby, Charles Henry	Paxton	52 Lincoln Avenue.
Dimock, Everett Tatman	Oxford	9 Phillips Street.
Doucette, Francis Anthony	East Braintree	Box 36, North Amherst.
Durkin, Harold	Waltham	Baker Lane, Care of Mrs. Webb.
Eager, Ralph Huntington	Milton	46 McClellan Street.
Ethier, Alfred Francis	Brockton	1 Cottage Street.
Eva, William James, Jr.	Amherst	19 Main Street.
Fanning, Ellis Vinal	East Bridgewater	97 Pleasant Street.
Feltham, Doris Leana	Springfield	6 Nutting Avenue.
Felch, Norman Seward	Salisbury	18 Cottage Street.
Field, John	Brookline	29 Lincoln Avenue.
Fox, Katherine Taber	Cambridge	34 Amity Street.
Fox, Nelson Bernerd	Lowell	50 Sunset Avenue.
Frost, Gardner Lane	Lexington	66 Lincoln Avenue.
Gleason, Cloyes Tilden	Hanover	5 Woodside Avenue.
Goduti, Joseph Lawrence	Somerville	29 Lincoln Avenue.
Gottfried, Helen	Tryon, N. C.	87 Pleasant Street.
Green, Stephen	Ware	2 Taylor Street.
Hakkinen, Arvo Otto	Gardner	12 Chestnut Street.
Haley, Herbert Francis	Orange	14 McClellan Street.
Hall, Richard Chesbro	Concord	33 Northampton Road.
Harris, Charles Warren	Orange	108 Pleasant Street.
Hart, Francis Edward	Hanover	12 Cottage Street.
Hartford, Myron Chester	Tyngsboro	Baker Lane, Care of Mrs. Webb.
Hartley, Winston	Waltham	13 Hallock Street.
Hastings, Judson Worthington	Agawam	2 Tyler Place.
Hay, William Campbell	Jackson Highlands, N. Y.	12 Cottage Street.
Hayward, Winfield Grant	Abington	42 McClellan Street.
Heiden, Carl Wadsworth	Springfield	81 Pleasant Street.
Hill, Edwin Wilpas	Gardner	12 Chestnut Street.
Hill, Jason Hartwell	North Brookfield	Box 36, No. Amherst.
Hirst, John William	Wellesley Hills	42 High Street.
Hodges, William Belcher	Stoughton	4 Tyler Place.
Hohman, Charles Francis	Abington	45 Fearing Street.
Holt, Chester Whitmore	Georgetown	8 Kellogg Avenue.
Johnson, Frederick Frisbie	Torrington, Conn.	19 Main Street.
Kastbjerg, Theodore	Worcester	10 McClellan Street.
Keene, Edwin Emil	Roslindale	10 Nutting Avenue.
Kinsman, Richard McLearn	Middleboro	9 Phillips Street.
Knight, Francis Meredith	Westhampton	83 So. Pleasant Street.

Kretschmar, Aubrey Constantine, Jr.	West Newton	2 Taylor Street.
Kyle, Alfred	Northampton	Northampton.
Lassman, Nathan	Haverhill	8 Kellogg Avenue.
Lee, Richard Henry	Northampton	Northampton.
Leonard, Kenneth Chester	Abington	18 Cottage Street.
Lewis, Richard Grinnell	Framingham	25 Lincoln Avenue.
Liukas, Arne Victor	Gardner	12 Chestnut Street.
Lowell, Chester Percival	Sudbury	86 Pleasant Street.
Lynn, Allan William	Brockton	13 Hallock Street.
MacGibbon, Hugh Ruyter	Northfield, Vt.	50 Main Street.
Mackie, Paul Logan	Pittsfield	14 Kellogg Avenue.
Mann, Robert Jerome	Worcester	7 McClellan Street.
McCoy, Samuel Leon	Roxbury	18 Spring Street.
McGrath, Allan Stanford	Dedham	Baker Lane, Care of Mrs. Webb.
Messier, William Edward	North Adams	7 McClellan Street.
Milligan, Edwin	South Groveland	15 Cottage Street.
Milner, Charlotte Miriam	Marshfield	34 Amity Street.
Mintz, Sarah Frances	Gloucester	34 Amity Street.
More, Fred Stanislaus, Jr.	Brighton	3 Nutting Avenue.
Morrill, Lester Trowbridge	Brockton	13 Hallock Street.
Morrow, Myrtle Louise	Attleboro	34 Amity Street.
Mosher, Earle Benjamin	Worcester	7 McClellan Street.
O'Grady, Francis John	Milford	75 Pleasant Street.
Oksanen, Arne Edward	Fitchburg	Meadow Street, No. Amherst.
Palmer, Allison Wesselhoeft	Braintree	Baker Lane, Care of Mrs. Dillingham.
Parks, Dana	Waltham	12 Cottage Street.
Peabody, Charles Roswill	Gorham, N. H.	8 Kellogg Avenue.
Phelon, Arthur Nelson	Granville	Baker Lane, Care of Mrs. Webb.
Piper, Albert Edward	Holden	66 Pleasant Street.
Putnam, Clyde Havens	Sutton	18 Nutting Avenue.
Rafkin, Barney	Brockton	1 Cottage Street.
Rich, Howard Lewis	Athol	4 Chestnut Street.
Rindge, Harold Raymond	Palmer	7 McClellan Street.
Roberts, Clinton Scott	Bristol, Conn.	74 Eames Avenue.
Rounsville, Leroy Lincoln	Middleboro	Box 36, No. Amherst.
Sarris, Andreas T.	Lowell	Baker Lane, Care of Mrs. Webb.
Sawyer, Robert Henry	Winchendon	84 Pleasant Street.
Schwartz, Joseph Pinkus	Revere	Baker Lane, Care of Mrs. Webb.
Shats, Alfred Julius	West Hanover	5 Woodside Avenue.
Shearer, Frederick Robert	South Hadley Falls	South Hadley Falls.
Sherman, Elizabeth	North Marshfield	34 Amity Street.
Sisson, Kenneth Robert	North Dartmouth	3 Hallock Street.
Smith, A. Willard	Northampton	Northampton.
Smith, Christopher Frederick	Holyoke	42 Cottage Street.
Sprague, Milton Cornel	Springfield	81 Pleasant Street.
Stephansen, Hans Christian	Churchville, Pa.	8 Kellogg Avenue.
Stone, Daniel Henry	Shrewsbury	10 McClellan Street.
Stromwall, Alton Evald	Bridgewater	8 Kellogg Avenue.
Swain, Seth Warren	Randolph	33 Northampton Road.
Swan, Donald Alexander	New Bedford	17 Kellogg Avenue.
Taft, William Lamb	Whitinsville	8 Kellogg Avenue.
Tamm, Agnes K.	Astoria, N. Y.	6 Nutting Avenue.
Taylor, Edmund Fernald	Amesbury	18 Cottage Street.
Tracy, Richard Hadley	Windsor, Vt.	50 Main Street.
White, Walter James	Marlboro	116 Pleasant Street.
Wilcox, Keith Hinton	Port Leyden, N. Y.	94 Pleasant Street.
Wilson, Douglas Craig	Bolton	86 Pleasant Street.
Wood, Edwin Porter	Dalton	R. F. D. No. 3, Box 83.
Worthington, Ernest Howard	Auburn	18 Nutting Avenue.
Zimmerman, Henry Adam	Auburn	13 Hallock Street.
Ziomek, Joseph V.	Amherst	R. F. D. No. 3, Box 111C.

Vocational Poultry Course, 1928.

Barclay, Robert Ancil	Winthrop.
English, Ethel Taylor	Canton.
Fisher, William Sidney	Mt. Ephraim, N. J.
Willard, Bernard Stevenson	West Springfield.

Winter School, 1928.

Alley, Harold E.	Wilbraham.
Apatow, Sarah	Hartford, Conn.
Baczenski, John	Warwick, R. I.
Barrows, William B.	Amherst.
Bates, Graham W.	East Weymouth.
Breed, Ralph C.	Clinton.
Burnett, Marston	Newtonville.
Burnett, Stanley H.	North Adams.
Cabot, Mortimer H.	Enfield.
Cargill, David L.	Valley Falls, R. I.
Carr, Archie D.	Rutland, Vt.
Carson, F. E.	Northampton.
Catherwood, Robert, Jr.	Lowell.

Clancy, Carl F.	Dedham.
Cleaves, Leighton G.	East Gardner.
Cliness, L. Elizabeth	Huntington, W. Va.
Conklin, John	Leverett.
Counsell, John L.	Mattapoisett.
Crehore, Ralph C.	Chicopee.
Davis, Jonathan	Sterling.
Davis, Robert A.	Charlton.
Davis, Russell	Charlton.
Dean, Charles O.	Springfield.
Dole, Harold S.	Richmond.
Dmytryk, Anna	Westfield.
Drury, Lewis F.	Clinton.
Durbin, Frank	Dedham.
Frederick, William J., Jr.	Schnectady, N. Y.
Frye, W. Russell	Medford.
Gates, Elizabeth W.	Hartford, Conn.
Golnik, Herman K.	Bristol, Conn.
Halpersohn, Jacob	Everett.
Hanson, Daniel C.	Dracut.
Harris, Mary J.	Deerfield.
Hartwell, J. Redman	Lincoln.
Hathaway, Joseph E.	Northampton.
Holmes, Arthur W.	Natick.
Huntington, H. P.	Northampton.
Jordan, W. Sumner	Holden.
Karp, Morris P.	Brooklyn, N. Y.
Kendall, Frank E., Jr.	Saranac Lake, N. Y.
Kingsbury, Carl	Belchertown.
Koennecke, Edward	Newton Center.
Lane, Charles L.	Rockport.
Latvis, John S.	Worcester.
Levine, Mary	Flemington, N. J.
Loud, Elliott C.	Hingham.
Low, Robert K.	Beverly.
Markert, Richard H.	Amherst.
Martines, Arnold	Providence, R. I.
Mawdsley, John H.	South Hadley Falls.
Mertz, Ralph W.	Northumberland, Pa.
Moran, Herbert J.	Canton.
Morgan, Frank F.	Springfield.
O'Connor, Vincent T.	Revere.
Partridge, Ashley W.	Lexington.
Pennell, Charles D.	Van Wert, O.
Pfaff, Charles W.	Hingham.
Pierce, Oscar W.	Marion.
Ross, Sidney	Jamaica, N. Y.
Serkin, Paul R.	Newton.
Sharpe, George H.	Hyde Park.
Shulander, Clifford	Bluffton, Ind.
Smith, Edna M.	Wakefield.
St. Georges, Antoinette	Webster.
Symmes, L. P.	Springfield.
Temple, Harold D.	Shattuckville.
Thompson, Everett M.	Woburn.
Thompson, Vinal	Auburn, Me.
Tuttle, William J.	Dorchester.
Vander Salm, Harold	Kalamazoo, Mich.
Wells, Arthur W.	Dracut.
Wells, G. Alliston	Springfield.
Williams, Phillips A.	Holliston.
Wolkenburg, Sidney L.	Brooklyn, N. Y.

SUMMER SCHOOL, 1928.

Graduate School Students.

Allen, Thomas	Belchertown.
Bower, James, Jr.	Holyoke.
Brown, Lorimer H.	Northampton.
Cartwright, Calton O.	Northampton.
Clark, Harold E.	Montague.
Clark, Hermon R.	Springfield.
Clarke, Miriam K.	Abington.
Dirks, Charles O.	Orono, Me.
Fitzgerald, Lillian	Holyoke.
Galbraith, Leo L.	South Amherst.
Gifford, Charles E.	Sutton.
Gilbert, Chauncey M.	Hatfield.
Gorman, Katherine L.	Holyoke.
Harvey, H. W.	Athens, Ga.
Hemingway, Justin S.	Williamsburg.
Hutchings, Frank F.	Amherst.
Kenney, Irene E.	Amherst.
Lindquist, Harry G.	Amherst.
Linehan, Mary DeL.	Amherst.
Miller, Mabel A.	Amherst.
Moody, Richard E.	Minotola, N. J.
Moriarty, Helen E.	Holyoke.
Moseley, Louis H.	Glastonbury, Conn.
Nagle, Dorothea M.	Northampton.

O'Brien, Mary E.	Greenfield.
O'Connell, Margaret M.	Holyoke.
O'Connor, Mary	Northampton.
Plantinga, Sarah T.	Amherst.
Putnam, Ernest T.	Greenfield.
Robbins, Mary E.	Monson.
Robbins, Zila	Indianapolis, Ind.
Ross, Donald E.	Amherst.
Smith, Noel D. W.	Northampton.
Stone, Mabel A.	Northampton.
Totman, Ruth J.	Conway.
Tulenko, John T., Jr.	Sunderland.
Turner, Charles E.	Springfield.
Weeks, Mildred A.	South Gardner.
White, Mildred W.	Amherst.
Wright, David S.	Northampton.

ENROLLMENT — NOT GRADUATE SCHOOL.

Alberti, Francis D.	Greenfield.
Alvord, Harriet	Wilmington, Vt.
Anderson, Andrew B.	Hudson.
Andrews, Elizabeth A.	East Falmouth.
Appleton, Eleanor E.	Lynn.
Avery, Irene J.	Greenfield.
Baker, Dorothy M.	Millers Falls.
Baker, Helen H.	Bridgewater.
Barrett, Mrs. Rolin H.	Amherst.
Barrus, Lena W.	New York, N. Y.
Barry, Gertrude	Newtonville.
Bedford, Harry	Whitinsville.
Bishop, Ruth F.	West Springfield.
Blaisdell, Matthew L.	North Amherst.
Blanchard, Esther H.	Whitman.
Boyarsky, Benjamin	Springfield.
Brand, James C.	Staunton, Va.
Brown, Mildred S.	North Amherst.
Brown, Pearle F.	Northampton.
Carbee, Ruth M.	Roxbury.
Carter, Esther B.	South Amherst.
Cassidy, Helen	Turners Falls.
Chapman, Gene M.	Bradford.
Chenoweth, Winifred L.	North Amherst.
Church, Dorothy L.	Springfield.
Clark, Gertrude	Lowell.
Clifford, Sara A.	Lawrence.
Collins, Alice V.	South Lee.
Connolly, Kathleen L.	Holyoke.
Cook, Emily E.	Rumney Depot, N. H.
Courtney, Mary C.	Holyoke.
Cowan, Elizabeth B.	Amherst.
Crean, Anne G.	Turners Falls.
Dickinson, Mabel H.	Holyoke.
Donely, Marian T.	Boston.
Donnelly, Ann H.	Jamaica Plain.
Dorgan, Anna L.	New Bedford.
Dorgan, Kathryn	New Bedford.
Douglass, Mrs. Lee H.	Grinnell, Iowa.
Dyer, Arnold W.	Falmouth.
Edmund, Annie H.	Amherst.
Eldridge, Eunice A.	Holbrook.
Emery, Helen B.	Marlboro.
Farren, Marguerite B.	Turners Falls.
Feltham, Doris L.	Springfield.
Fenton, Mary B.	Northampton.
Fisher, Lina E.	Amherst.
Flint, George B.	Lincoln.
Gallagher, Charles F.	Springfield.
George, Grace D.	Amherst.
Gifford, Flavel M.	Hatfield.
Giles, Marian B.	Northampton.
Goding, S. C.	Amherst.
Goss, Ralph H.	Montague City.
Grady, Julia H.	Salem.
Gruber, Bella	Maynard.
Grunwaldt, Lucy A.	South Hadley.
Hart, Mary C.	Holyoke.
Hardendorff, Ruth M.	North Amherst.
Hastings, Maude J.	Amherst.
Hawks, Marguerite L.	Newton Center.
Hawley, Guila G.	Westfield.
Healy, Katherine R.	Worcester.
Heath, Gertrude A.	Huntington.
Henderson, Everett S.	West Hartford, Conn.
Hilbert, Alfred G.	Chicopee Falls.
Hinds, Elizabeth	Winchester.
Holden, Ruth E.	North Amherst.
House, Louise D.	West Hanover.
Howard, Lucius A.	Ridgewood, N. J.
Howe, Alice B.	Nantucket.
Howe, Edward J.	Nantucket.

Hubbell, Gene	Springfield.
Jenney, Lucy E.	Fairhaven.
Jones, Howard F.	Greenfield.
Jones, Janet	Amherst.
Jones, Mildred	Cambridge.
Kay, John R.	Roslindale.
Kilbourn, Alice M.	South Lancaster.
Lenigan, Margaret L.	Holyoke.
Lyons, Ella R.	Dorchester.
Mack, Helen R.	Quinebaug, Conn.
Madden, Archie H.	Amherst.
Mara, Earl J.	Pawtucket, R. I.
Marsh, Kendall H.	Holden.
Martin, Margaret	Amherst.
Maxfield, Lillian B.	Holyoke.
Meriam, Richard S.	Amherst.
Morse, Alice M.	Marlboro.
McQueston, Dorothy E.	Hadley.
Newcomb, Bertha A.	Deerfield.
Noonan, Helen M.	Holyoke.
O'Connor, Margaret A.	Northampton.
Oldfield, Estelle	Fairhaven.
Paksarian, John	Franklin.
Parker, Catherine S.	Framington.
Patch, E. K.	Stoneham.
Poggi, Vera F.	New York, N. Y.
Porter, Dorothy J.	Turners Falls.
Powers, Marcella K.	Florence.
Pray, Francis C.	Amherst.
Putnam, Isabel S.	Turners Falls.
Quinn, Sally A.	Dorchester.
Readio, Marian A.	Florence.
Reid, Mary E.	Worcester.
Richardson, Carolyn	West Roxbury.
Rutan, Huntington	North Hadley.
Sears, Florence H.	Amherst.
Shaw, Doris E.	Amherst.
Sheerin, Mary	New Bedford.
Skillings, Susan H.	Amherst.
Spaulding, Ruth E.	Amherst.
Spooner, Laurence W.	Brimfield.
Stearns, Lucy B.	Westfield.
Stott, Marion F.	Holyoke.
Sweeney, Albert S.	Amherst.
Thomas, John E.	Springfield.
Thompson, Nellie L.	Amherst.
Townend, Janet	Fitchburg.
Tuxbury, Grace M.	Brockton.
Waugh, Alice V.	Amherst.
Wheeler, Blanche E.	Marlboro.
Whiton, Florence J.	Springfield.
Williams, Fannie L.	Weymouth.
Winch, Ruth G.	Templeton.

STUDENTS REGISTERED AFTER THE CATALOGUE FOR 1927–28 WAS PUBLISHED.

STOCKBRIDGE SCHOOL OF AGRICULTURE.

Kenney, Ethel A.	Winchendon.

SUMMARY OF SHORT COURSE ENROLLMENT.

	Men.	Women.	Total.
Stockbridge School of Agriculture:			
Second year	102	4	106
First year	126	10	136
Vocational Poultry Course	3	1	4
Winter School, 1928	67	8	75
Summer School, 1928	51	114	165
Totals	349	137	486

DEGREES CONFERRED — 1928.

Doctor of Philosophy (Ph.D.).

Tietz, Harrison Morton, B.S., Massachusetts Agricultural College	Richmond Hill, N. Y.

Master of Science (M.S.).

Dull, Malcolm F., A.B., Hope College	Muskegon, Mich.
Emery, Herbert Martin, B.S., Massachusetts Agricultural College	Newburyport.
Fessenden, Richard William, B.S., Massachusetts Agricultural College	Middleborough.
Kelly, Oliver W., B.S., Colorado Agricultural College	Fort Collins, Colo.
Larsinos, George John, B.S., Massachusetts Agricultural College	Westfield.
MacMasters, Majel Margaret, B.S., Massachusetts Agricultural College	Collinsville, Conn.
Rivnay, Ezekiel, B.S., Massachusetts Agricultural College	Amherst.
Swanback, T. Robert, Agronom., Agricultural College of Ultuna, Sweden	Windsor, Conn.

Bachelor of Science (B.S.).

Abrahamson, Howard Joseph	Waltham.
Albertini, Paul Flanders	Billerica.
Amatt, Jack	Northampton.
Ansell, Harold King	Amherst.
Avery, Blanche Deane	Greenfield.
Barnard, Ellsworth	Shelburne Falls.
Bartlett, Kenneth Alden	Dorchester.
Batchelder, Lora Margaret	Easthampton.
Baumgartner, Hans	Pittsfield.
Bearse, Gordon Everett	Sharon.
Beeman, Marjorie Elise	Ware.
Botulinski, Frank John	Boston.
Bradford, David Carlton	Springfield.
Bray, Frederick Roland	Amherst.
Bray, Walter Abner	Amherst.
Brockway, Horace Taylor, Jr.	South Hadley.
Church, Cornelia Bassett	North Amherst.
Clark, Harold Eugene	Montague.
Cook, Albert Cairnes	Waverley.
Cooke, Dorothy Mabel	Richmond.
Davis, Richard Jackson	Arlington.
Dean, Carolyn	Utica, N. Y.
Denton, Ian Oliphant	Boston.
Drake, Dorothy Madeline	Newton.
Draper, William Hill, Jr.	Watertown.
Dresser, Horatio Malcolm	South Hadley.
Elliott, Lawrence William	Waltham.
Emory, George Edward	Marlboro.
Estes, Wendall Eames	West Duxbury.
Evans, Joseph Andrew	Lawrence.
Ewer, Seth Judson	Leyden.
Ferguson, Thomas Wells, Jr.	Newtonville.
Forest, Joseph Henry	Arlington.
Fox, Robert Leo	Ware.
France, Frances Thompson	Amherst.
Freese, Paul Frederick	Waltham.
Goldberg, Maxwell Henry	Stoneham.
Hall, Harriet Phoebe	Great Barrington.
Hall, John Stanley	Lynn.
Hatch, Harold Curtis	Melrose.
Hilyard, Joseph Raymond	Beverly.
Hodson, Alexander Carlton	Reading.
Homeyer, Frank Fuller	Wellesley Hills.
Howland, Walter Morton	Conway.
Hyde, William Eaton	Amherst.
Karrer, Robert Joseph	Hingham.
Kennedy, Wellington	Red Bank, N. J.
Kidder, Dana Judson, Jr.	Fayville.
Ladas, Constantine Pericles	Boston.
Lane, Donald Ricker	Brockton.
LaPrise, Albert Joseph	Great Barrington.
Laubenstein, Karl George	Maynard.
Lawrence, Julia Ruth	Springfield.
Leonard, Charles Smith	Chicopee.
Leonard, Dorothy Luella	West Springfield.
Lincoln, Margaret Elizabeth	Shirley.
Lincoln, Robert Alexander	Hingham Center.
Little, Margaret Adams	Newburyport.
Loring, Douglas Winthrop	Springfield.
Love, Elizabeth Perry	Auburn.
Lynsky, Myer	Dorchester.
Malley, Joseph Anthony	Watertown.
Marsh, Edwin Elliott Robinson	Pittsfield.
Marston, Leon Chester, Jr.	Brockton.
Marx, Walter Herman	Holyoke.
McEwen, Leslie Irving	Winchester.
McGuire, Walter Kenneth	Whitinsville.
Moore, Ethan Dana	West Springfield.

Morey, Elizabeth Alma	Wollaston.
Moriarty, Robert Earl	Monson.
Mulhern, Daniel Joseph	Roslindale.
Mullen, Francis Redding (as of the class of 1927)	Becket.
Murch, Ralph Gordon	Holliston.
Murdough, Edwin Lincoln	Springfield.
Noble, Frank Freeman	Fall River.
Nutting, John Lyman	West Berlin.
Owers, Robert Hammond	Taunton.
Panzica, Josephine	Arlington.
Pickett, Thomas Austin	Beverly.
Plantinga, Oliver	Amherst.
Plantinga, Sarah Theodora	Amherst.
Pratt, Marjorie Johnson	Dalton.
Preston, Charles Putnam	Hathorne.
Preston, Stanley Nichols	Hathorne.
Quinn, John Francis	New Bedford.
Redgrave, Arnold Ide	Hopedale.
Reed, Roland Ellsworth	Greenfield.
Rice, Cecil Curtis	Worcester.
Ricker, Albion Barker	Turner, Me.
Roper, Hartwell Eveleth	Closter, N. J.
Russell, Charles Edwin	West Brookfield.
Ryan, Edward Parker	Swampscott.
Schappelle, Newell Allen	Amherst.
Schmidt, Ernest John	Longmeadow.
Smith, Leslie Rockwell, Jr.	Hadley.
Smith, Walter Russell	Holden.
Southgate, Barbara Willson	Marshfield.
Spencer, Ernest Leavitt	Lowell.
Stratton, Frank Colquhoun	Boston.
Sullivan, Charles Burke	Fall River.
Thomas, Howard	Holyoke.
Thompson, Leonard Lewis	Greenfield.
Trull, Henry Bailey	Lowell.
Tufts, John Warren	Jamaica Plain.
Tulloch, George Sherlock	Bridgewater.
Tuttle, Alden Parker	South Medford.
Van Hall, Walter Bernhardt	Roslindale.
Voetsch, George Bernard	Greenfield.
White, Edwin Searles	Worcester.
Wilder, Edwin Arthur	Sterling Junction.
Williams, Florence Dorothea	East Norton.
Worssam, Horace Herbert	Bernardston.

BACHELOR OF VOCATIONAL AGRICULTURE (B. VOC. AGRI.).

Allen, Leo Linwood Fenton	Athol.

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AMHERST, MASSACHUSETTS

VOLUME XXI FEBRUARY, 1929 NUMBER 2

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THE SIXTY-SIXTH ANNUAL REPORT OF THE MASSACHUSETTS AGRICULTURAL COLLEGE

Issued in Accordance with Section 8, Chapter 75, of the General Laws

PART I.—THE REPORT OF THE PRESIDENT AND OTHER OFFICERS OF ADMINISTRATION FOR THE FISCAL YEAR ENDED NOV. 30 1928

DEPARTMENT OF EDUCATION
THE COMMONWEALTH OF MASSACHUSETTS

Publication of this Document approved by the Commission on Administration and Finance

3M-5-'29. No. 5588

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MASSACHUSETTS AGRICULTURAL COLLEGE

REPORT OF THE PRESIDENT TO THE BOARD OF TRUSTEES, 1928

I believe that there is ample justification for an optimistic tone to this, my second, annual report to the Board of Trustees.

Co-operation between trustees, faculty, alumni and administrative officials of the Commonwealth during the year just passed has made possible significant progress for the College. In the many propositions which have been considered by one or several of these groups, I have found a splendid spirit of co-operation and a faithfulness to the welfare of the College which has been most heartening to a new President.

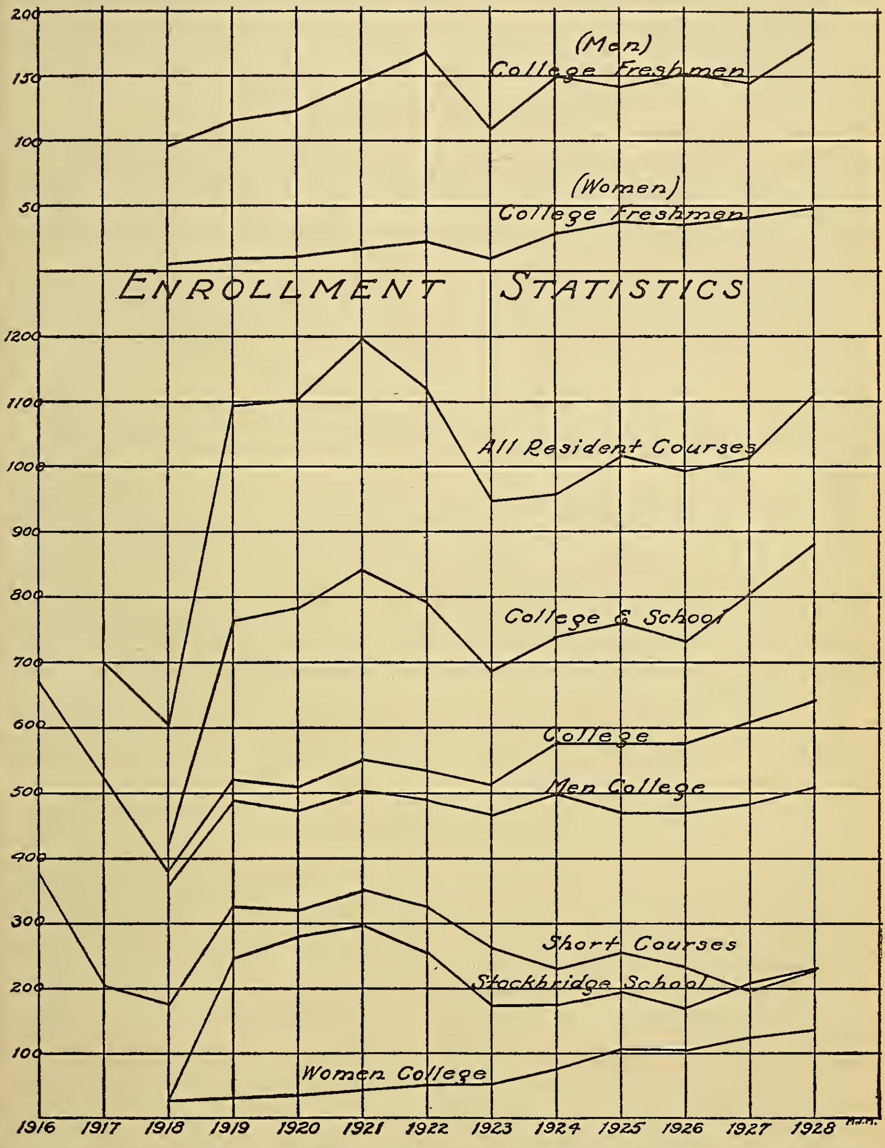
REVIEW OF THE YEAR

Student Enrollment

Student enrollment has again surpassed all previous records. The total enrollment of resident students in the college and school courses this year numbers 894, of which 639 are in the college and graduate courses and 255 in Stockbridge School of Agriculture. This is a larger enrollment than we have ever had for college and school together and the largest college enrollment in our history. The freshman class numbering 218 is the largest we have ever had. Its increase in size over that of last year is due chiefly to an increase in men students since the enrollment of women is only slightly larger than last year.

A study of enrollment statistics for the College shows a natural decline in attendance during the war period and a large increase immediately following the war, reaching its peak in 1921. From then until 1923 there was a very considerable decline in enrollment. Since 1923 there has been a gradual increase each year with the exception of the year 1926. This annual increase has been largest during the last two years. The reasons for this fluctuation in attendance are evident for the most part and hardly need mention. The significance of the study is in the light it sheds upon probable future development. The factors which have apparently influenced enrollment in the past seem to be favorable to a continuation of the growth of the past two years. I believe we may reasonably expect for the next few years the approximate 10 per cent growth of the past two.

Such growth is of course encouraging and yet in a sense it is embarrassing. It is embarrassing because of some lack in physical plant equipment which I shall discuss later and also because of the overload which it makes in some of our teaching departments. The policy of reducing the personnel which was wisely pursued



Student Enrollment for Years 1916 to 1928 during a period in which there was little or no growth in student enrollment cannot be wisely followed in a situation of an increasing student body. It is probable therefore that I shall have to recommend to you from time to time, as I have this year, the establishment of certain new positions in our teaching staff to care for an increasing student body, and we shall certainly need to consider our general building program from this standpoint as well as that of needs for other activities of the institution.

Changes in Faculty Personnel

There have been considerably fewer changes in personnel this year than there were last. I have no doubt that the state's classification of personal service by which salary standards were generally raised and salary ranges definitely defined has had a beneficial effect. I am of the opinion that the salary limits are still too low in some of our higher grades; but believe that in most cases the ranges set are quite satisfactory.

The important position of Director of the Experiment Station was vacated December 15, 1927, by the resignation of Sidney B. Haskell. Director Haskell was also Head of the Division of Agriculture so that his leaving really created two vacancies. We were fortunate to procure the services of Fred J. Sievers first as Director of the Experiment Station and later he accepted the responsibilities of Head of the Division of Agriculture. He is well fitted by training and personality to perform acceptably the duties of these offices and we have already come to appreciate the large contribution which he can make to the service of the institution.

Director Haskell, as you know, was outstanding in his position and brought much credit to the institution not only through the splendid service which he rendered here but by his activity and fine reputation in national circles.

Other resignations of particular significance were those of John P. Helyar, Extension Specialist in Agronomy, and Elizabeth F. Hopkins, Analyst in the new Seed Control Service. Mr. R. W. Donaldson, formerly Assistant County Agent in Middlesex County was appointed to Mr. Helyar's position and Mr. O. W. Kelly was transferred from Instructor in Agronomy at the College to the position vacated by Miss Hopkins.

The death of William F. Howe while in the service of the College as Assistant State Leader of County Club Agents was a grievous personal loss to his many friends in the College and a distinct loss to the institution. Mr. Harley A. Leland has recently been appointed to fill this vacancy.

The Course of Study

After two years of careful study and consideration, the faculty committee made a definite recommendation to your Board to change the college course of study so that it will more effectively serve, I believe, the needs of our students. This change you have approved and it is now being put into operation, beginning with the Class of 1931. It does not involve the inauguration of new or additional courses; but is rather a rearrangement of the major courses of study and a broadening of the requirements for graduation so that the Bachelor of Science degree from this College means now, more than ever before, these three essential characteristics: scientific foundation, cultural background and professional training.

Instead of the seventeen major courses of study formerly offered there are now five, as follows: Agriculture, Home Economics, Horticulture, Physical and Biological Sciences, and Social Sciences. The student majoring in any one of these is required to take enough work in a single subject within the major group to insure his specialized professional training and is also required to take at least a prescribed minimum of work in other groups for the sake of broadening his training and insuring so far as possible a cultural and scientific background.

The general effect of this change is to broaden the field of specialization for our students and yet insure that all of our graduates will have had some training in all of these subject matter fields in which this College specializes.

The Stockbridge School

The action of your Board in giving the definite name "The Stockbridge School of Agriculture at the Massachusetts Agricultural College" to what was previously known as the "Two-Year Course in Practical Agriculture" has done much to clear up misapprehensions as to the nature of this course and to firmly establish it as the non-degree, vocational agricultural course of the College.

Under the former designation the school lacked individuality and the course was frequently considered by outsiders and applicants for entrance to it to be one-half the four year college course. There was also the possibility that graduation from the two-year course might be misrepresented or misunderstood to mean graduation from the college course. This possibility has now been removed.

More important, however, is the fact that we are better able than before to meet a very definite and specific need in agricultural education. This is a widely recognized need for technical vocational education beyond the trade school or secondary grade, but of shorter duration and of more specifically vocational character than is to be found in the degree courses of the College. I believe the Stockbridge School of Agriculture fulfills just this purpose and will serve admirably both as an experiment and an example in vocational education of junior college grade.

College Year Lengthened

In the past, the three terms of the college year have been of such unequal length that it has been very difficult to plan courses which would have approximately equal value. The spring term has been so short that the faculty has complained that it has been almost impossible to get into it a complete course of real value. The Course of Study Committee of the faculty therefore voted to extend the college year from thirty-five to thirty-six weeks. Because of the fact that the Christmas holidays fix the date of closing the fall term and opening of the winter term, the only way to use this added week to increase the length of the last two terms was to schedule Commencement one week later. This has been done, beginning with the current year, so that Commencement will now come the third week-end in June instead of the second as heretofore. The committee appreciated that there are some disadvantages in changing Commencement to this later date but felt that the advantage of a better balanced curriculum which is gained outweighs these.

Special Educational Meetings at the College

The college campus and its facilities are being more and more used for educational meetings of various kinds, sponsored sometimes by the College and sometimes by outside organizations. Thirty-two such meetings were held during the past year. The total estimated attendance was 10,073. These meetings are generally in charge of the Extension Service of the College and used as a means of extending the educational facilities of the College to the citizens of the state who cannot or do not take advantage of the regular resident courses. Polish Farmers' Day, Farm and Home Week, Poultry Breeders' Conference, Tobacco Field Day, and Home Economics Conferences are examples of this kind of meetings.

The use of the College physical plant facilities by other educational organizations is becoming more frequent. During the past year meetings were held here under the auspices of the Connecticut Valley Section of the American Chemical Society, the English Folk Dance Society, Massachusetts Veterinarians' Association, and others.

The annual High School Day was conducted again by the College for the benefit of boys and girls who are interested in the possibility of continuing their education here. It is the purpose of this meeting to provide an opportunity for such students to inspect the facilities of the College, to see the activities of the student body and to discuss the training offered with members of the faculty. Approximately 700 prospective college students attended this meeting in 1928 with very satisfactory results, I believe, both to them and to the College.

For several years it has been our custom to conduct on the day preceding High School Day judging contests in livestock, poultry, and fruit for pupils of Massachusetts high and secondary schools including county agricultural schools. The State Department of Agriculture and the Division of Vocational Education of the State Department of Education have co-operated with the College in making these contests successful. This year 110 schools were represented by 180 students in these contests. In addition, the Division of Vocational Education organized a state-wide public speaking contest for students under its jurisdiction and this contest culminated in a final oratorical at the College on the evening before High School Day. The College conducted a literary contest for high school pupils of the state which attracted 38 competitors from 33 schools.

I believe this High School Day is a very worth while enterprise. It shows forth the educational opportunities which the College offers in a most effective manner and it must help many of the hundreds of students who attend to plan better and more intelligently for their college course.

Repairs and New Construction

A Home Economics Practice House was the principal construction enterprise of the year. The old farmhouse just north of the women's dormitory was remodelled at a cost of $7,500 so that it will be a valuable acquisition to our equipment for Home Economics teaching. The Women's Advisory Council has undertaken to furnish this house and is now raising funds for this purpose.

A new cottage was constructed for the foreman of the Experiment Station farm whose house was taken for the practice house. The cost was $7,500.

A new refrigeration system was installed at Fisher Laboratory at a cost of $8,000. This has proved a very satisfactory addition. Not only does it give us a better refrigeration system but it liberates large storage space, formerly used for ice, for the storage of fruit.

There was available by appropriation $40,000 for the construction of an addition to Paige Laboratory which was not expended. This project was planned originally with the intention to make room in Paige Laboratory for the housing of both the Departments of Veterinary Science and of Bacteriology and Physiology. The removal of the latter department to Paige Laboratory would have some advantages in combined operation of two departments using somewhat similar equipment and would vacate the Microbiology Building. It was thought that the latter might then be used to house other work in some way whereby suitable quarters might be provided for the research and educational work of the Department of Horticultural Manufactures, which has urgently needed added facilities for many years past, and which it was a principal object of this project to provide.

However, on careful examination of the several buildings which would be involved in the proposed shifts, it was found that the new arrangement would not provide suitable quarters for Horticultural Manufactures and further would require extensive and expensive alterations in the Microbiology Building to make it suitable for any other use than the one to which it is now put and for which it is admirably adapted.

Hence, after conference with the State Commission on Administration and Finance, it was decided not to expend the funds which had been appropriated to remodel Paige Laboratory and instead to revive the original project for a separate new building to provide for the needs of Horticultural Manufactures and to present in the coming year a request that the $30,000 appropriated last year be combined with an additional appropriation of $40,000 and used to erect a Horticultural Manufactures Building. If this request is granted, it will provide excellently the facilities for the latter department, which was one of the principal objects of the project as discussed last year.

PROBLEMS AND POLICIES

The Name and Scope of the College

As you know, there is in progress, in the public press and otherwise, active discussion of the possibility of changing the name of this institution.

When the request from the Student Forum that such action be taken came before you at your meeting last June you voted to lay the matter upon the table for consideration at some later time when the report of the results of the survey of and recommendations concerning the activities of the Land-grant Colleges is made by the Federal Bureau of Education. Since that time, there has been renewed discussion and activity in connection with this proposal by students, alumni, and citizens of the Commonwealth and it seems to me to be wise and desirable that I should make at this time the following brief statement of the facts concerning the name, functions, and activities of the institution as I understand them.

"Massachusetts Agricultural College" is the name of an institution, established in response to Federal and State legislation, which has had assigned to it by the laws of the state five different major functions. These are: resident teaching of collegiate grade leading to academic degrees; resident teaching of short courses of various kinds of which "Stockbridge School of Agriculture" is the major part; agricultural extension service; agricultural experiment station work; and control service in connection with the enforcement of regulatory laws concerning the sale of agricultural commodities.

The relative proportions of the services rendered by the institution in each of these five fields is indicated by the distribution of expenditures and faculty time to them during the past year. For resident teaching of degree courses there was expended 42 per cent of the total funds available to the institution and 43 per cent of the professional staff were on the college teaching staff. Short course teaching used 11 per cent of the funds and 13 per cent of the professional personnel. The agricultural experiment station expended 24 per cent of the funds and employed 26 per cent of the staff as research workers. The agricultural extension service used 17 per cent of the College's funds and 11 per cent of the staff for central office and specialists' instruction; while the counties of the state contributed a little over 1.6 times as much in addition to this phase of the work. The analytical service for control work used 6 per cent of the College funds and 7 per cent of the personnel.

It is obvious that the work of the last four of these groups, constituting 58 per cent of the institution's activities, is wholly agricultural in its methods, purposes and results. If there be added to this the proportion of resident teaching in collegiate degree courses which is concerned with agricultural practice alone, omitting agricultural science courses as having other possible uses, it is evident that over 65 per cent of the activities of the institution are directly concerned with the promotion of the agricultural welfare of the State. If to this there be added the collegiate work of the institution in the fields of preparation for agricultural science and business, it can be shown that almost exactly three-fourths of the institution's work at present is agricultural in its objectives. From this viewpoint, therefore, it certainly cannot be said that the present name "Massachusetts Agricultural College" is a misnomer.

Recently, about 500 of the 890 students who are receiving resident instruction on the campus this year signed a petition asking that the name of this institution be changed to "Massachusetts State College." These students are all in the collegiate degree-granting section of the institution, which corresponds to the "College" as it exists at other institutions than the State and Federally-supported ones like ours which have additional functions and duties besides resident teaching. In other states, these "land-grant" institutions are known by a variety of names; such as "State University", "State College", "College of Agriculture and Mechanic Arts", "State Agricultural College", "State Polytechnic Institute", etc. Several states have changed the name of their institution as its functions and standards have changed with changing needs of the state. The essential question so far as this state is concerned is whether there is now a need for such a change at this College. From the viewpoint of the whole of the institution's activities, it would seem that there is no such need. From the viewpoint of the collegiate teaching work of the institution, however, there is the debatable question whether the name of the institution should continue to suggest, what is not now nor never has been a fact, that its resident teaching is narrowly professional or vocational in character, or should be changed to show clearly the fact that this is the state-supported institution in Massachusetts for education of collegiate grade designed to afford (in the words of the author of the original Federal act) opportunities for the "liberal and practical education of the industrial classes in the several pursuits and professions of life."

The Bureau of Education of the United States Department of the Interior is now engaged upon a survey of all of the "land-grant colleges" of the country. This survey was inaugurated at the request of the National Association of Land-grant Colleges and Universities and was approved by Congress in order to determine how the intent of the original act to establish these colleges is being carried out in each of the several states of the Union, what the relation of these land-grant colleges to other educational agencies in each state now is, and what the general policy of these institutions should be for the future.

The report of this survey will be an official announcement by the Federal Bureau of Education of the general Federal policy with reference to these institutions. It is expected that the report will be made in 1930.

It would seem to be a wise policy for this particular state and institution to wait until this report is available before entering upon any extended discussion of the future policies (including the changing of the name of the College) of the institution.

However, I recognize that there is a possibility of other views than my own, as just expressed, concerning the desirability of action in this matter at this time.

Honorary Degrees

Your Board has the general rule not to grant any honorary degrees. This has been excepted from only in the one outstanding and unquestionably highly meritorious case of former President Edward M. Lewis upon whom you conferred the degree of Doctor of Laws in June, 1927.

Recently, there have been brought to my attention two other almost equally meritorious cases of men who have had some intimate connection with this College in the past and who have rendered such signal services to the causes of education, or agriculture, or both, that it would seem to be highly desirable to give them the recognition and appreciation that is conveyed by the award of an honorary degree from the institution.

Hence, the question as to whether your Board should again depart from its established custom or abandon it as a principle, is one which might well receive early consideration.

Professional Improvement for Staff Members

A problem closely akin to that just discussed is that of providing opportunity for professional improvement for members of our staff as an antidote for stagnation in service. As I pointed out last year, some opportunities for graduate study by younger members of our teaching staff have been provided in our own Graduate School. Several are taking advantage of this opportunity, which, however, is necessarily limited.

Attendance at meetings of professional societies is a most helpful and inspiring stimulus and is permitted on the basis of payment of one-half expenses by the individual and one-half by the institution within the limits of the funds available for out-of-state travel. The number of persons who were permitted to take advantage of this opportunity during the past year was 26 and the total cost to the institution was $848.41. Out-of-state travel for executive purposes, for which the whole expense is borne from institutional funds cost $1,863.02.

Other means for professional improvement, such as leaves of absence for advanced study and opportunities for professional service which widens one's understanding and broadens one's experience, which are provided by many other educational institutions for their staff members, ought to be introduced at ours as soon as arrangements for them which can be approved as a part of this State's fiscal policy can be devised.

Building Needs

It seems to be inevitable that each President's annual report shall present building needs as one of the urgent problems of the institution. These needs have been discussed with you so often that it seems undesirable now to reiterate general discussions of the matter.

But there are certain specific needs which the increase of 19.6% in our student enrollment during the last two years is bringing acutely to the fore and which it would be altogether unwise to fail to call to the attention of your Board and to the public in general.

The first of these is for dormitories. The town of Amherst is now crowded to its utmost limits of capacity. For a time this past fall, it looked as though some 30 or 40 prospective students in Stockbridge School of Agriculture would have to return to their homes because of inability to find sleeping quarters in Amherst. Fortunately, by going as far from the College as North Amherst and South Amherst, all were finally located in rooms. No further expansion is possible, however, unless additional rooming facilities are provided either by the College or by citizens of Amherst.

One lamentable aspect of the situation is that by reason of the earlier opening of the fall term and longer duration of the year for College students than for Stockbridge School students, the latter are the ones who find greatest difficulty in securing rooming accommodations; yet they are the students who must come to our institution for this type of special vocational education which is not available to them anywhere else.

Of no less vital importance is the urgent need for a physical education building. This need has been so well and so thoroughly set forth by the alumni of the College in their campaign for funds for this building that it need not be repeated in detail here. The alumni should be heartily congratulated for their loyal interest in this phase of the institution's needs and their efforts supported in every possible way. Their campaign is making good progress and it is my most earnest hope that it may come speedily to full success.

As has been pointed out above, there seems to be reasonable assurance that the Legislature of 1929 will provide for the erection of the horticultural manufactures building, the need for which as an addition to our facilities for instruction and research in a highly specialized field of great economic importance to this State, you have repeatedly presented in the past. This will provide a much-to-be desired addition to our equipment, but will do little to relieve congestion elsewhere.

With reference to needs for additional buildings for teaching purposes, it should be pointed out that while we now have, as has been stated in the past, laboratory and recitation rooms sufficient to accommodate one thousand to twelve hundred students if they continue to major in those subjects for which these buildings were specially equipped, changes in economic development and in opportunities for employment in new lines of business result in increased enrollments in courses of study for which our present building equipment is wholly inadequate. This is especially true at present of our work in landscape gardening and landscape architecture which is of such outstanding quality and has so many economic opportunities that it is attracting many more students than we now have adequate equipment for. Physics and home economics are also very inadequately and unsatisfactorily housed; while many other departments are handicapped in their use of quarters which have been provided specifically for their needs by the necessity of assigning to these rooms classes in the social sciences which have no home of their own on our campus.

I am convinced that one step which would do more than almost any other to relieve congestion in classrooms and add to efficiency and morale in the College, would be the erection of a general recitation and lecture building in which could be brought together the classroom work in economic and social sciences which is now so widely scattered over the campus to the detriment of the work itself and of the other departments in whose quarters it is now being carried on.

Other phases of our building needs are described in detail in connection with the requests for special items of appropriations presented elsewhere in this report.

Regulatory and Control Services at the College

Since the earliest days of legislation for the control of the sale of fertilizers, feeding stuffs, and other agricultural commodities, this institution has been called upon to make analyses and tests to aid in the enforcement of these laws. This has been done most acceptably from the standpoint of accuracy and fidelity in analytical service and also has given opportunity for effective educational work by the College with respect to the best methods of preparation, sale and use of these commodities. The people of the State have come to have great confidence in the service of the College in this way.

This has resulted in constantly increasing demands for service of this kind by the College. Recent examples of this are the seed control law and the poultry disease control law which have added greatly to the volume of analytical service required from the College. This increases considerably the total budget of the College although the increased cost to the State is more than covered by receipts from fees for the work which are turned into the state treasury. It is estimated that the cost to the institution to carry on this control and service work for the current year will be $67,400. To offset this there are to be estimated receipts of $73,850.

I have no doubt that this is a thoroughly worthwhile service for the College to render to the Commonwealth and that it contributes something to our research and instructional service as well. But it should be kept clearly in mind that this large and growing part of the institution's budget is due to a service which the College is rendering to the State at no cost, and in fact is a source of some profit to it.

Production and Sales Policy for Productive Departments

One other problem of policy seems to need attention. It has been considered by your Board in years past and perhaps needs now only a restatement of policy and method. I refer to the matter of sales of products arising from the operation of the College Farm and of certain other departments of the College.

On the one hand, these departments are under constant pressure from interested citizens or groups to so plan and conduct their production programs and operations that they will serve as demonstrations of practical farm operation. This means, in many cases, production of volumes much beyond the institution's needs for instructional use or other consumption and hence makes considerable quantities of products available for sale.

On the other hand, private producers of these same products for sale on the same markets object strenuously, and with some reason, to competition in their business by state-financed operations.

How to adjust our operations to these two opposite views of the matter is a constant problem. I believe the only sound and defensible program is to conduct these operations in such volume as will best serve the educational and research purposes of the institution and to sell the products resulting from these operations in such a way as will bring a proper income from them to the State with as little disturbance to, or competition with, private producers in this locality as possible.

CONCLUSION

I trust that the report which I have just presented justifies to you the feeling of optimism which I indicated at its beginning. The review of the year seems to me to indicate definite and substantial progress in many ways. The questions of needs and policies which I have tried to outline briefly indicate that there are problems yet to be solved. This is a healthy condition of affairs. If our problems were all solved our task would be ended. Further, I am sure that you have noticed that these problems are all those of increased or better service to the Commonwealth. Hence, while they may sometimes be perplexing and may require long and diligent effort on our part, they offer the reward of the conscientious service well rendered in their solution and I congratulate you as the Board of Trustees and myself as your President upon the opportunities which are ours.

Roscoe W. Thatcher,
President.

BUDGET FOR 1929

The following requests for appropriations for the support of this institution for the fiscal year beginning December 1, 1928, have been transmitted to the Commission on Administration and Finance for consideration in connection with the preparation of the state budget for the year.

GENERAL MAINTENANCE

	Personal Service	Maintenance Expenses	Total
General College	$428,810	$115,807	$544,617
Experiment Station	80,402	17,798	98,200
Extension Service	61,762	39,850	101,612
Market Garden Field Station	8,400	6,000	14,400
Short Courses	65,040	12,900	77,940
Heat, Light and Power		57,000	57,000
Physical Plant Expenses	24,000	47,000	71,000
Fertilizer Control Law	11,400	3,600	15,000
Poultry Disease Law	21,080	13,920	35,000
Milk Testing Law	480	320	800
Commercial Feeding Stuffs Law	9,100	2,000	11,100
Seed Control Law	3,775	1,725	5,500
Laboratory Service	4,890	750	5,640
Trustee Expenses		1,200	1,200
Printing Reports		1,500	1,500
Totals	$719,139	$321,370	$1,040,509
Emergency	–	–	5,000
Total request for maintenance			$1,045,509

Projects for Permanent Improvement

1. HORTICULTURAL MANUFACTURES BUILDING, $70,000

This building is needed to adequately house and equip the present department under one roof instead of having its activities scattered throughout four buildings in remote parts of the campus. It is also planned to provide sufficient class and laboratory rooms for normal growth and development of the department.

2. MEN'S DORMITORY, $150,000

For many years the Trustees have had before them the problem of providing adequate housing facilities for the resident students of the College. The demand for a dormitory has become increasingly pressing each year. Capacity of private houses available for student rooms is taxed to the limit and prices charged to students are high as a result. Emergency accommodations had to be provided this year to take care of students enrolling late because no available rooms could be found in town. The Trustees are again presenting this project as one of the most urgent in the list. It is proposed to build a dormitory which will accommodate approximately one hundred students. By charging a rental somewhat less than that charged in private houses off the campus it is estimated a return of from two to three per cent can be made to the State on this investment.

3. ABBATOIR FOR ANIMAL HUSBANDRY, $14,000

This building and equipment are needed to afford facilities for teaching the courses in meats and meat products now being taught without adequate facilities.

4. RENOVATION IN DAIRY LABORATORY, $4,000

The floor and walls in the market milk room of Flint Laboratory are greatly in need of repair. Modern construction requires tile walls and floors in such buildings and this estimate is based on these requirements.

5. Farm Storage for Winter Vegetables, $3,000

A storage is needed which will adequately store root crops, cabbage and celery, that these crops may be saved for instruction purposes and to equalize the sales throughout the year. The storage can be constructed in such a way as to be a demonstration of a practical storage type for Massachusetts farms.

6. Two Six-Car Garages, $5,000

At present there are no garage facilities for the farm or for the building and maintenance department with the result that the automobiles and tractors are stored in other buildings not suitable or are without any sort of garage facilities. This appropriation is required to take care of the situation.

7. House for Chief Engineer, $7,500

In order to take care of the many calls for attention outside of regular hours some provisions should be made for the chief engineer to live near the plant. No private dwellings seem to be available for this purpose and it, therefore, seems advisable to recommend the construction of a house to care for this situation.

8. Roads, $10,000

In order to provide improved roads for the main thoroughfares of the Campus, it is proposed to build small sections of these from year to year. In 1929 it is desired to extend the macadam road started in 1923, an additional 1,800 feet from the library building to the power plant. This section carries the heaviest traffic which comes to the Campus and the present dirt road is entirely inadequate, especially during the seasons of frost and of heavy rain. The estimated $10,000 is for a five inch crushed rock foundation with the three inch bituminous bound surface.

9. Cement Walks, $3,000

We should build some portion each year of the much needed permanent walks on the Campus. It is proposed this year to build cement walks from present Olmstead Road walk to Experiment Station and from Wilder Hall north to Experiment Station.

10. Automatic Scale at Power Plant, $2,000

This scale is needed to check the delivery of coal.

11. Poultry House and Hot Water Brooder, $2,050

No poultry house has been built at the College plant for seven years and there is need for a building which will embody modern construction ideas.

12. Fireproofing Library, $40,000

State Fire Inspector, Ira C. Taylor, reported in 1926 that "Should a fire get any headway in this building, it would not take long for same to destroy the entire interior and its contents." He made the following recommendations:

1. Replace the wooden flooring throughout the building with concrete flooring.
2. That the cellar ceiling be protected with metal lath and cement plaster not less than $\frac{3}{4}''$ in thickness.
3. That both stairways be inclosed in fireproof partitions with all door openings in same protected by self-closing fire doors.
4. That all woden book-stacks be replaced with steel book-stacks.

In view of the fact that the contents of this building are estimated to be worth $500,000, much of which could not be replaced if destroyed by fire, this appropriation is requested to carry out the protective program recommended above.

REPORT OF THE DEAN

A large part of the work of the Dean's Office is of necessity connected with the more or less routine matters of absences, records, reports, and conferences. Students are encouraged to bring their troubles, criticisms and problems with the assurance that they will receive a sympathetic hearing. This requires many personal conferences during which it is possible to make suggestions and propose remedies which not only help the individual student but also build up a student's loyalty and morale based on the solid foundation of a mutual understanding. Such conferences claimed much of my time during the year.

The general conduct of the student body was all that could reasonably be expected. Serious discipline cases were few. A fine spirit of student co-operation welcomed opportunities to assist and support the administration in its efforts to regulate student conduct and honor. Of course there were the usual indiscretions sufficient in number and variety to encourage those who believe that the modern youth is "out of hand."

The number of students dropped because of poor scholarship at the close of the first term was less than ten per cent. In practically every case the dropped student or his parents sought the advice of the Dean in an attempt to answer the question, "What is the next step"? In some cases the answer can readily be made and made correctly. In others, however, I find myself unable to offer a satisfactory answer. To be sure the student can not do our work without more thorough preparation, but whether he has either the inclination or ability to get it is not always evident. I am convinced from my experience in handling failed students that it is a serious mistake to encourage some of them to attempt the course again. This problem needs further study and it is one which will receive attention this year.

To encourage and direct those students who continue and are really capable of carrying our courses with profit, the usual methods found satisfactory in former years were continued. However, there are still far too many whose grades indicate that they are not doing capacity work. Since only the contented and interested student really works we gave our best thought to the improvement and inauguration of those exercises and schemes which produce the proper student atmosphere.

Accordingly attention was given to such matters as the size of classes, conflicts in schedules, credit requirements, class room arrangement and student guidance.

The advisers who assisted me in handling the new students were: Asst. Dean Lanphear, Professor Julian, Professor Rand, Professor Serex, Professor Goding, Professor Skinner, Mr. Boutelle, Mr. Anderson, Mr. Briggs, Miss Knowlton and Miss MacMasters.

To encourage the high ranking student, an attempt was made to organize an honor course open only to members of the Senior Class with an average standing of at least 80 per cent. Due to the fact that the students eligible could not agree on a course in which all were interested the project could not be launched. The problem is now being considered by a special committee and definite plans for effective honors work are being formulated. It is hoped that a beginning may be made early next year.

Much work was also done to bring extra curricular activities, assemblies and entertainments to their rightful place in the college. Particularly noticeable was the increased interest in our Social Union program. All of the lectures and entertainments have been of an exceptionally high order. Much credit for their success rightfully belongs to Secretary Hawley and the members of his Social Union Committee.

Morning chapel, which is held twice a week on Monday and Friday at 7:35 A.M. and at which student attendance is required, has assumed a new importance. The leaders of these chapel exercsies have tried hard to make this brief assembly inspiring and instructive. That their efforts have been successful is indicated by the interest which the student body has shown and the fine spirit manifested at every exercise.

The same statement may be made with reference to the midweek assemblies. The men and women who speak at these meetings are chosen with the greatest care.

Sunday Chapel, which has caused trouble for many deans and other officers at other institutions, is in strong favor with our students. The regulations governing attendance are so administered as to make the students feel that attendance is practically voluntary. At the same time the service is made so helpful that the student can not easily afford to miss it. The average attendance at these services has doubled during the last few years and the sentiment of the student body is overwhelmingly in favor of continuing them. Just recently one of our visiting ministers who preaches to college students in many Eastern and Middle Western institutions remarked, "I would rather speak to the students at M. A. C. than to any other group I visit. They are both interested and appreciative." Deserved compliments like these indicate that the time and effort spent in planning these exercises is fully justified, especially when viewed from the standpoint of its effect on conduct and scholarship.

Four years ago the college entered into an agreement with the Division of Vocational Education of the State Department of Education under the terms of which *bona fide* graduates of Vocational Schools of Agriculture and Agricultural Departments in Massachusetts High Schools were admitted to the college to pursue a course of study for the degree of Bachelor of Vocational Agriculture. The Vocational Division of the State Department assumed final responsibility for the certification of all candidates for entrance under this plan. This trial agreement expires this year. Our experience with the students admitted under the plan justifies the continuance of the agreement and immediate steps should be taken to renew it.

An increasing number of applications from normal school graduates and undergraduates who desire to qualify for our Bachelor of Science degree has raised the question of a proper evaluation of transfer credits. Very often such applicants have been teaching for several years and have accumulated, in addition to normal school credits, those for work taken in several extension courses and summer schools. The subject matter of such courses is usually quite different from that offered at this college. Since the standards for the teaching profession are continually being raised, high school teachers, who prepared themselves when requirements were lower, are now finding it necessary to obtain the bachelor's degree if they are to be promoted, or in some cases even to hold their present positions. Such teachers are turning to this college with the request that we give them credit for their many courses, even though the subject matter differs from ours, in order that they may receive our degree with the minimum of additional study. Although we have not been inclined as yet to encourage such transfers, the increased call for service to these teachers raises the serious problem for which a satisfactory solution must be found.

As chairman of the committee in charge of the Land-Grant College Survey at M. A. C., I devoted every available hour which could be spared from my regular duties during the early autumn to its direction. The survey is made by the questionnaire method — each phase of activity being covered by a special questionnaire, varying in length from 42 to 410 pages. The work on the last of these questionnaires for our College is almost completed. The results of this survey are awaited with great interest and should prove of tremendous value to those responsible for shaping the policies and programs of Land-Grant Colleges.

The entering class this year numbered 218 students, 48 women and 170 men. This was the largest class in the history of the college. This increase raised no serious problem so far as the teaching force and college equipment were concerned, but it did tax our housing facilities to the limit. Accordingly, I would again call your attention to the crying need of freshman dormitories. Other reasons why these should be provided were emphasized in my report for the year 1923.

The revised course of study, approved by the Trustees last year, was put into effect with the class of 1931 when they registered for their first term's sophomore courses. The adjustments which had to be made in our machinery for registration were easily effected. We have reason to believe that the changes made will mark a distinct advance and will prove satisfactory to faculty and students.

The funds available for scholarships have been combined and were found to be sufficient for twenty-two scholarships of $60 each. These have been awarded to needy students on a scholastic basis. More money for this worthy purpose could be profitably invested in promising and deserving students.

A problem which needs careful study in the immediate future is the setting up of an effective placement bureau. A beginning has been made by Mr. Grayson, who is doing all he can with the time available. But I am convinced that we are not yet in a position to serve effectively either the prospective employer or the alumnus who asks our help.

The year has been a busy one. We have made progress and face the new year with confidence.

William L. Machmer,
Dean.

REPORT OF THE DIRECTOR OF THE GRADUATE SCHOOL

During the year 1927–28 radical changes in the Graduate School have been few. One course has been added. This is in the Department of Dairy Husbandry and leads to the M.S. degree. Otherwise such changes as have been made were those which promised to produce greater efficiency in department subject matter or in general administration.

Nine advanced degrees were conferred at Commencement, June 11, 1928, eight being Master of Science and one Doctor of Philosophy.

Registration for the year covered by the catalogue (Oct. 1, 1927, to Oct. 1, 1928) included 108 students, many more than the usual number though three less than the year before. It is interesting to note that forty different institutions are represented, students coming from all parts of the United States.

The method of keeping records of the work and general status of graduate students has been carefully revised during the year. Heretofore no records had been kept outside the departments concerned, of the prerequisites and collateral subjects necessary for different students to remove. Now this record is kept in the Director's office and the status of any student at any time is at once available.

A regulation established last year, that prior to final selection of a thesis subject an outline of the work planned and of the problems it offers be submitted for examination, has already proved of great value by preventing the selection of subjects not of proper thesis nature or not wisely planned. To properly judge these plans the advice of specialists in different lines has been asked for in several cases and has been of much assistance. To prevent a student from spending a year or more upon a subject which, after completion, would be quite certain of rejection as not up to thesis standards is a decided benefit to the student concerned as well as a protection to our thesis standards in general.

The great increase of knowledge during the last half century has markedly affected modern education. Before that time a college course was considered as being largely for the purposes of general education and culture, and one who intended to take up graduate work did not expect any specialized education before doing so. This meant from five to eight years of study before beginning the active practice of his life work and was too expensive for many to undertake. But, as the various fields of knowledge have grown, three years have become inadequate in which to thoroughly train a specialist. This has led to pressure upon the colleges to permit specialization during the undergraduate course, and for this and other reasons, students may now restrict their studies to a considerable extent, within certain lines, during their last two undergraduate years, and in some cases even earlier.

This has resulted in the dropping entirely or reducing the time of one undergraduate course after another, and filling the time thus made available, with specialized work. Even with this earlier start, however, the time is rapidly becoming too short in which to become familiar with all that is known of any subject, and this has led to specialization in divisions only, of the main subject, and a correspondingly narrower advanced training.

In many ways, the effect of this has been far from satisfactory. Each year the close relation and interlocking with each other of the different sciences, at least, is more apparent. To be a specialist in animal physiology, for example, a good knowledge of chemistry, physics, biology, and bacteriology is necessary, and the need of such tools as French and German, with which to keep in touch with what is being done in foreign countries, is also important.

Yet at the present time the undergraduate does not have the time to get these subjects, in addition to his special work, which are usually deemed necessary for every educated man. The result too often is a training which takes the form of a cone, beginning in a small way with the junior year and increasing in size to the end of graduate work, which its possessor is constantly striving to stand on its apex, without having enough of the collateral and subsidiary subjects necessary to make it stand firmly.

This situation is rapidly becoming serious, particularly as students often fail to realize their condition and strongly resist all efforts to provide them with the basic subjects needed to properly support the unbalanced superstructure they have been building upon such an inadequate foundation.

This phase of modern specialized education is rapidly becoming a serious defect in our educational system, and calls for careful consideration by students of pedagogy and leaders of graduate work in this country. Thus far no solution of the problem seems to have been found. Yet, lacking the broad knowledge of many sciences and their interrelation which in part have produced some of our most fundamental principles, epoch making discoveries of broad principles of life and of the world in which we live can hardly be expected if only narrow types of training become universal.

H. T. Fernald,
Director, Graduate School.

REPORT OF THE DIRECTOR OF SHORT COURSES

Change of Name

Perhaps the most important event during 1928 in this department which I have to record is the change of name of our "Two-Year Course in Practical Agriculture" to "The Stockbridge School of Agriculture at Massachusetts Agricultural College." It seems particularly appropriate that such a change should have come on the tenth anniversary of the establishment of this type of educational service at the College. As a first step toward the adoption of the change, the basic reasons for and practical values of the new name were clearly and carefully laid before the alumni and undergraduates. The senior class of 1928 gave enthusiastic support to the undertaking by making a thorough poll of the alumni, and when the returns indicated a decisive choice, there remained no further obstacle. We were able to present the new diplomas for the first time to the graduating class of 1928. In a further effort to adjust this new situation without embarrassment to graduates of earlier classes, we have arranged to supply the new form of diploma without charge to any graduate who may wish to apply for it.

1928 Graduation

On Saturday, June 2nd, the Class Day exercises were held in Memorial Hall. As its gift to the College, the 1928 Class presented the sum of $50.00 to the Physical Education Building Fund. As a matter of historical record, I may say that every graduating class has made some gift to the College of useful or ornamental value, as a token of their appreciation and regard. On Saturday evening the class play was presented in Bowker Auditorium and, while cultural courses are not a regular part of the vocational curriculum, the enthusiasm, skill, and ability of the student players call for special commendation. Instructor Harold W. Smart, as dramatic coach, has been able to do much with the small and inexperienced student group available.

Rev. John H. Grant of Fairfield, Conn., gave the Commencement Sermon on June 3rd, and the speaker for graduation on June 4th was Clarence H. Dempsey, Commissioner of Education of Vermont. Diplomas were presented to fifty-four men and five women.

Within one month after graduation, 90 per cent of the men graduates were located on satisfactory jobs. Good positions were secured by many such as: (1) Foreman of M. A. C. fruit storage plant; (2) Salesman for a large Detroit feed concern; (3) Grower and assistant to manager, florist's business at Gloversville, N. Y.; (4) Greenskeeper in charge of golf course at Green Bay, Wisconsin. Eleven students returned home to take up business with their fathers, and nine men found positions where they had taken placement training the season previous, showing what frequently happens as a result of the placement program.

Stockbridge School Enrollment

For the second consecutive year, we can point to an increase of students in the Stockbridge School of Agriculture. Over 150 new applications were received and 135 students registered in the freshman class in October.

Ninety-two senior men returned for the second year's work out of a class of 111 men taking placement training. This shrinkage of 17 per cent, after the six months' farm training, is not alarming when the reasons are presented. Mr. Grayson reports only 5 failed in their field work; three transferred to college courses — two to M. A. C. and one to Cornell; three secured good jobs and preferred to continue where placed in order to accumulate funds and get more practical training (may return later); two withdrew for financial reasons, one for poor health, one joined the navy, and one got married. Thus, out of 19 who did not return only 5 actually had scholastic difficulties. Considering the fact that these men have only six months' resident contact with the College before taking up work away from the campus for the next six months, the number of students who complete the full course indicates an exceptionally strong interest in the work and an appreciation of this type of vocational training.

A larger number of graduates entering from the county agricultural schools this year increased the senior group, 4 girls included, to 105 students. The total registration for both classes was 240.

Placement Training

Emory E. Grayson, Supervisor of Placement Training, was able to meet a 30% increased demand for student placements in his first year by locating practically all the men in satisfactory training positions during March and April. Distribution of students on types of farming is indicated by the following table:

Animal Husbandry	22
Dairy Manufactures	8
Floriculture	13
Horticulture	24
Pomology	19
Poultry	23
Vegetable Gardening	2
Total	111

Ninety students on placement sent in regular monthly cash account records which were checked by Professor Rollin H. Barrett of the Farm Management department. Some interesting totals were secured as compared with last year.

	1927	1928
Number of students reporting	70	90
Total cash receipts	$23,845 85	$35,348 50
Total net expenses	13,252 60	19,526 86
Balance or amount saved	$10,593 25	$15,821 64

	1927	1928
Average cash receipts per student per month	$71 82	$71 41
Average cash expense per student per month	39 91	39 44
Average amount saved per student per month	$31 91	$31 97
Total earned per student	$340 43	$321 35
Total gross earnings (cash receipts plus board and room allowances)	$32,189 06	$43,014 82

The final figure for total earnings, $43,014.82, for 1928, indicates conclusively that students secure considerable aid in their college financing through the income from their training work.

Employment Bureau Service for Graduates

Mr. Grayson has enlarged the scope of his service to seek employment opportunities for both Stockbridge School and College graduates in agriculture. He is making new contacts with prospective employers constantly and persons desiring trained men are finding the services of this office of distinct benefit. Recommendations are made after careful investigation and only when capable candidates are available. A tendency to fill every job or to place every man, simply because he is a graduate, and without consideration of his record, would be fatal to the success of this work. All employment service is rendered without charge.

GRADUATE EMPLOYMENT SERVICE, 1927–28

MAJOR	NUMBER ENROLLED		Number of Positions	NUMBER PLACED	
	Stockbridge	College		Stockbridge	College
General Agriculture	33	15	55	16	5
Dairy Manufactures	27	5	23	8	1
Poultry	27	2	26	11	1
Horticulture	21	5	14	5	3
Vegetable Gardening	3	2	7	2	1
Pomology	15	5	14	6	1
Floriculture	10	–	11	3	–
All Others	5	17	23	1	8
Totals	141	51	173	52	20
Other Short Courses	15	–	–	–	–
Grand total	207		173	72	

Total salaries for all employment contacts made	$97,872 00
Summer placement wages for Stockbridge School Students	43,014 82
Grand total employment income	$140,886 82

Representatives of the following companies have been at the college during the year to interview seniors and have been assisted by Mr. Grayson in every way: American Bell Telephone Company; United Fruit Company; W. T. Grant Company.

Summer School

Twenty-six courses made up the program of the summer school, all but six securing sufficient enrolment to justify continuance. Despite new summer school opportunities made available for teachers in this section which it was felt might tend to reduce our enrolment, a registration of 165 kept the school at about a normal size. Teachers continue to make up the largest part of the student group.

Winter School

Forty-seven students registered in the ten-weeks courses and twenty-eight attended the three ten-day courses offered in the winter school program. The special school for greenskeepers continues to maintain its popularity so that enrolment has to be strictly limited to laboratory accommodations.

For 1929, we are planning to incorporate all poultry courses in a special ten-weeks poultry program as these special school courses grouped about one industry, and offering a complete program promise to attract more students for a short period of study and are of more practical value.

Roland H. Verbeck,
Director of Short Courses.

REPORT OF THE LIBRARIAN

There are now in the Library 82,832 bound and catalogued books, besides some ten thousand uncatalogued volumes, and probably fifty thousand pamphlets in such order that they can readily be found when needed. During the past year 2,875 volumes have been added and catalogued. The number of department libraries at present is forty-five, two having been consolidated with larger ones during the year. The number of volumes in these department libraries ranges from fifty to six thousand, and all are represented in the catalog at the main library, so that all book resources of the college are thus available for an investigator at one place.

The books circulated during the year, December, 1927, to November, 1928, inclusive, were 9,822, and pamphlets, 932, the largest number being taken out in April, when 1,274 were thus asked for.

The Library was open 342 days during the year, including part of Sundays during term time. The change of Sunday hours, from morning to afternoon and evening, has not yet been in force sufficiently long to justify settled judgment. Changes in the building have been fewer this past year than in recent preceding years, as about all that can be done to render the present building safe and convenient seems already done. A rearrangement of the built-in furniture of the chapel floor has made the room much more convenient and neater looking, and an appreciated study alcove has been arranged where the organ formerly stood. Some painting has been done, but more ought to be done if the present building must be used for some years to come, since the library ought certainly to be not less clean and esthetic than other college buildings.

The work of arranging the great number of duplicate and uncatalogued magazines and books, long neglected, has gone forward steadily, until after four years of overwork, order begins to appear in all parts of the library. The staff of the library has labored faithfully at these tasks which necessarily lie outside the regular and necessary routine, and are therefore extra difficult.

The great need at present is fireproofing, to protect the great collection of books which forms one of the great agricultural libraries of the world, and whose loss would be an irreparable blow to the college. Of course more space is urgently needed, for the clerical work of the library, for book storage, and for study space, but it is possible to operate in the present building for some years to come with no greater inconvenience than has been suffered for some years past.

The attitude of students toward the library is increasingly loyal, and there are fewer infractions of the few necessary rules. A slight relaxation of the strictness of watch upon reserved books has resulted in economy of administration and in responsibility and honor among students. It is hoped that co-operation from the teaching staff of the college will make this advance in college spirit permanent, and even permit a further gain.

Basil B. Wood,
Librarian.

REPORT OF THE DIRECTOR OF THE EXTENSION SERVICE

Necessity for condensing this report into a very few pages limits the opportunity to adequately discuss the important developments in extension work for the year.

Additional financial support to the extent of $20,000 was made available when Congress passed the Capper-Ketcham Bill. Its primary purpose is to promote further extension teaching by using 80 per cent of the money to employ agents in counties and the remainder in adding to the facilities of the staff at the college. When each county has added either a club, home economics, or agricultural agent to its present force, and the college has added two specialists to its staff, there will be 13 new extension workers in the state. These additions will give opportunity for readjustments which will benefit each of the three lines of work.

Finding persons qualified to fill these county and state positions is proving difficult, and many of them are still open. An assistant to the state club leader has been added to the specialists, but the new position of child development specialist remains unfilled after three months of searching.

The increasing toll taken by field crop diseases brings to the Service the problem of furnishing growers with practical information as to the methods of controlling these diseases. So great has been the demand that a specialist in plant pathology is needed if the college is to continue to perform the most valuable service in making agriculture profitable.

The steady increase of labor saving machinery in all lines of agricultural pursuits; the number of demands for help in planning and erecting efficient agricultural buildings of all sorts; and the installation in rural homes of running water, sewerage systems, and other comfort giving and labor saving devices make it evident that a specialist is also needed in agricultural engineering.

Extension specialists feel keenly the need of time for study if they are to continue to meet their responsibilities. Teaching year after year without occasionally having a few weeks or months for professional improvement will sooner or later make the services of the extension teacher of decreasing value to those he is employed to keep informed of up-to-date developments in the field of agriculture and home making. Agents in the counties, feeling this handicap, are discussing and endeavoring to find ways in which to overcome the limitation, and it is hoped that before many years some plan will be created for giving the desired opportunity.

The U. S. Department of Agriculture has continued to give its support to our service with its experts and funds appropriated by the several acts of Congress for extension work. Co-operation with the public agencies interested in the fields of agriculture and home economics has continued on the same constructive basis as in the past several years. Commodity agricultural organizations and associations concerned with the problems pertaining to the home maker are continuing to give their active support in opening the way for the extension teacher to increase his or her effectiveness.

During this year, the specialists have formulated their ideas for working out the problems pertaining to their branches of agriculture, home making, or club work into a plan which, if followed, will record the progress made toward definite goals to be reached in the next five years.

The New England Institute of Cooperation, which convened on the campus in July, was given full support. All of New England was well represented, those attending including managers, officers, and members of co-operative associations as well as many county agents, specialists, economists, and professional experts.

Revision of 11 old bulletins and publication of 16 new bulletins have been accomplished. Timely news items and special articles have been released to the agricultural periodicals as well as to some of the city newspapers of the state. The house organs of the Extension Service and of the college have been edited and published while a news writing contest has been conducted for 4-H club members.

The radio has been used to the extent of 62 broadcasts by 25 speakers from the college and extension staff. These broadcasts included the latest findings and developments in the fields of the subjects discussed and resulted in about 400 written comments and questions.

Alfalfa and sweet clover acreage has increased in the state during the year and pastures have received increased attention through fertilizer demonstrations for the purpose of teaching dairymen the results of the Massachusetts Experiment Station research in pasture treatment. The 300-bushel potato club now has members from nearly every county in Massachusetts to whom special instruction for improving their yields has been given.

Lime manufacturers have continued to keep in close touch with farmers' problems by following their first conference at the college in 1927 by meetings at Pittsfield and Kingston, Rhode Island, in 1928.

Every county but one now has a dairy herd improvement association. These associations employ 12 supervisors who visit 285 herds with a total of 5,500 cows. Their records and management practices are used as teaching material for members and also for those not included in the associations' membership.

Co-operation has been given to the tuberculosis tested herd owners' associations in each county; the average membership being more than 200. The Massachusetts Dairymen's Association is co-operating with other dairy groups to effect uniform regulations for the production of clean, safe milk.

The farm management and agricultural economics specialists are working closely together, assembling and putting into teaching form farm economic facts for use by the other specialists. Poultry account books are analyzed and summarized, herd improvement association records are studied, economic facts influencing the markets are collected and interpreted, work is being pushed to furnish the market garden industry with a knowledge of its economic position, and "Farm Economic Facts", a monthly leaflet of pertinent economic information, is being published. Both specialists are members of the college committee on the "Economic Status of Massachusetts Agriculture" which has published two bulletins; one on potatoes and one on dairy replacements, while a poultry study is under way.

The importance of forestry has been recognized more than previously. Release cutting, thinning, and planting have been the major operations during 1928, conducted with woodlot owners and with the boys and girls of the 4-H clubs and scout organizations. Since forestry is one of the recent projects, it is necessary to give a great deal of time and effort to interesting woodlot owners in fundamental practices.

Pomology extension teaching transformed 8,000 undesirable varieties of apple trees into standard sorts through top grafting during 1928. Fruit was examined in 35 orchards and counts made of apples injured by disease or pest. Information from this source, coupled with that secured from the inspection of a box of cull apples from 30 other orchards, will be used to improve the spray program. Meetings of growers in the markets have been for the purpose of showing the actual condition of fruit after it has arrived as well as the requirements of the market. A bulletin with colored plates showing the merits of the seven standard apple varieties was prepared and distributed in co-operation with the other New England states.

Thirty-six storage plants with a capacity of 250,000 bushels were planned or constructed. Fifty-four meetings in 49 communities with 1,525 people have been held in home food preservation. In addition, 30 meetings were held with the juniors to whom follow up service letters and bulletins were sent.

Progress in poultry is indicated by the achievements of Massachusetts breeders in egg laying contests as well as at home. Improvement in the health and quality of the stock and its management, together with better business practices, is resulting from the extension program. The 22 local associations, together with the state-wide federation, make it possible to reach large numbers of poultrymen with economy of time and effort. The Massachusetts Association of Certified Poultry Breeders continues to support the disease control and stock improvement program, while turkey production is increasing under the leadership of the specialist. The first poultry breeding school, organized by the poultry department, was attended by more than 110 poultrymen and specialists. It is hoped that this school will be followed by others in the future.

In vegetable gardening, satisfactory results have been attained in controlling mildew on cucumbers through the use of "Guko", a new dust prepared according to a formula developed by the Massachusetts Experiment Station. Sales of lime to market gardeners have increased materially while new carrot and beet seeds superior in yield and quality are being developed and distributed to market gardeners. The apple scab spray service conducted by the Field Station has reached 2,800 growers during the year. The Mansfield cucumber growers have been aided in forming a group which is furthering better grading, packing, and marketing of their produce. A label has been adopted and paper cartons for packing the cucumbers have been introduced. Thus much has been accomplished toward maintaining a steady market for the members' crops.

The Biological Survey of the U. S. Department of Agriculture continues to station a full time specialist in rodent control at Amherst. Demonstrations in control of rats, mice, rabbits, woodchucks, crows, etc., are conducted for the protection of crops and orchards. Work is greatly stimulated by lantern slides and lectures; also by fair exhibits.

Five meetings of the Cooperative Dairy Council of Massachusetts have been held with an average attendance of 21 and an average representation from six companies. Discussions of business problems of these companies are helpful to all. One new company has been assisted to establish proper accounts, secure sound legal advice, and manage the details of its plant more economically.

Exhibits were prepared and set up at 25 fairs, at six of which 3,814 requests were received for information. One hundred fifty people registered in correspondence courses, two of which were recently revised. Large numbers of bulletins and circulars have been distributed through announcements sent to mailing lists, these having been thoroughly revised and brought up to date. Outlines for short talks on agricultural, horticultural, and home making subjects were furnished to state grange lecturers.

Farm and Home Week was unusually well attended, more than 600 automobiles being parked about the college grounds on one day. The programs of all departments were popular, with the rooms accommodating the home makers overcrowded at many of the sessions. More direct publicity, coupled with good weather, may have been responsible for the very satisfactory attendance in spite of a season which delayed haying, making it difficult for farmers to leave their fields. Farm and Home Week was the largest of the many meetings held on campus during the year, with a total attendance of 6,000.

In 4-H club work, local leader training schools and Camp Gilbert both helped to develop leadership. A campus club has been organized by the girls of the college who were 4-H club members previous to coming to M. A. C. There are now 23 members. Interest in judging contests is steadily growing. Results of contests at seven fairs show that 383 boys and girls participated.

Visits have been made to the several counties for the purpose of developing and planning work outlines. In poultry, better organized clubs, larger flocks, more chicks hatched, and earlier chicks are direct results. Improved organization with more people willing to be leaders is apparent in the garden clubs. A very noticeable improvement has been shown in the quality of the vegetables exhibited at the fairs.

The following developments in the home economics program during the past year connote progress: In nutrition, studies have been made through home visits and other means to ascertain the existing problems of mothers of young children. Lists of names of mothers have been compiled in all counties and material helpful to the solution of their nutrition problems will be sent by mail. Most of the nutrition work has been conducted on the leader-training basis, which means that contacts have been made with a very much larger number of young mothers than previously.

With the appointment, in 1927, of a full time home management specialist, a program of work has been developed in every county of the state. Increased attendance at general meetings, larger numbers of women enrolled in community groups, the development of leadership for project work, and many requests for assistance in the solution of all kinds of home improvement problems all manifest the growth of this work. The rural engineering department of the college has co-operated in giving advice and help in the installation of water in many homes of the state.

During the year practically all of the clothing work has been put on the leader basis, thus reaching at least ten times as many homes as formerly. Emphasis has been put on the problems of selection of clothing, and with the co-operation of merchants it has been possible to give a great deal of help to a large number of home makers.

Child development and parental education has been an entirely new phase of the extension program. Many study groups have been organized and much interest is manifested in a study of the problems in the development of children.

The increased number of leaders among the home makers of the state, the balanced programs which communities are carrying, the introduction of some phases of recreation into the day's program, the co-ordination of all the projects in the light of a home maker's needs are helping to solve the problems of the home. Knowing conditions, not as we think they are but as they really are, has given a larger perspective and a finer vision to all the workers concerned with the building of homes.

The Extension Service is being considered more each year as an organization with voluntary local leaders in communities co-operating with the county agents and state specialists and receiving assistance from the U. S. Department of Agriculture. It is working by educational means on the major problem of maintaining a profitable farm business from which a satisfactory and contented rural home and community may be supported.

Willard A. Munson,
Director of the Extension Service.

REPORT OF THE DIRECTOR OF THE EXPERIMENT STATION

Since the last annual report, there has been a change in the administration of the Massachusetts Agricultural Experiment Station caused by the resignation of former Director Sidney B. Haskell and the appointment of his successor. During the interim between the date that Director Haskell's resignation became effective and February 1st, 1928, when the new Director entered upon his duties, the position was filled by President Thatcher himself. The present administration, therefore, not only has the advantage of taking up the work after it had been thoroughly organized and effectively directed under seven years of successful administration by its predecessor, but it can also capitalize on the wide experience of President Thatcher in this particular field of institutional service. In general, no drastic changes in the organization and promotion of a program of investigation were deemed necessary or advisable and this year's record is, therefore, largely one of progress in those activities well under way at the end of 1927.

The investigational program, as at present organized, is carried forward under sixteen different departments in the institution, namely; Agricultural Economics, Agricultural Engineering, Agronomy, Bacteriology, Botany, Chemistry, Cranberry Growing, Dairy Manufactures, Entomology, Farm Management, Home Economics, Horticultural Manufactures, Pomology, Poultry Husbandry, Vegetable Gardening, and Veterinary Science. Besides these there are also the inspection services organized under Fertilizer, Feed, Dairy Glassware and Seed Control. The object is to use, not only to best advantage all facilities in the institution that are considered suitable to Experiment Station service, but also to serve the best interests of agriculture in general, and especially the agriculture of Massachusetts and the New England section.

To avoid unnecessary duplication of effort in the several state experiment stations located in the northeastern portion of the country where states are small in area and where general natural conditions (climatic and otherwise) show considerable similarity, conferences between the Directors of the twelve northeastern states are held annually. Through these meetings, the several stations have found it possible to agree on a more or less definite division of the work, particularly in those fields most closely identified with applied agriculture. This plan should and does allow greater concentration of effort on some particular phase of the subject under investigation, thus making for greater economy and effectiveness in the determination of those facts essential to the solution of some of the many problems with which the industry is confronted. The New England Research Council, which meets annually in Boston, is intended among other matters to accomplish the same results for research projects in economics in the New England States.

The last year has seen another of the regular $10,000 increases in the support from the Federal Purnell fund which now in its fourth year has reached a total of $50,000 annually. The increase from this fund has been utilized and applied to satisfy in part the demand for new work and also to cover the increases in salary provided for members of the immediate staff. The Purnell fund will reach its maximum with another $10,000 increase, thus bringing the total support from this source for Experiment Station use up to $60,000 per year beginning with July 1st, 1929. Since the State appropriation for Experiment Station has remained stationary during the years that support from Federal funds were on the increase there will need to be provision made for a regular annual increase in State support after July 1st, 1929, if the progress under the plan now in operation is to be assured.

The increase from Federal funds has made it possible to, in part at least, meet a demand for greater service in the departments of Dairy Manufactures, Home Economics and Pomology which were slightly enlarged both in staff and equipment during the year.

To render a service much desired and long sought, provision was made through special State appropriation for the establishment of two laboratory services. The one in Bacteriology, in direct charge of Assistant Professor Ralph L. France, is designed to give definite and specific information regarding such matters of general interest and importance as purity and sanitation of public and private water and milk supplies, and the composition and effectiveness of any commodities found on the consumer's market regarding the wholesomeness or value of which there may be some question or suspicion. The laboratory in Veterinary Science, in direct charge of Assistant Professor Glenn L. Dunlap, is established to furnish diagnoses in response to a demand for service regarding safe feeds for live stock and live stock disease elimination. Both of the laboratories are intended to be at least partly self-supporting through a fee system based on actual cost of service rendered. To just what extent these services will develop time alone can tell. Suffice it to state, however, that this type of service is not readily available through any other source and, therefore, has strong support from those who have made contact with the laboratories. The Veterinary Science laboratory should prove especially effective in supplementing the large program of poultry disease elimination work which has already assumed proportions of such economic significance that further enlargement of the present program or even its continuance would scarcely be justifiable without the supplement of a diagnostic service.

Among needs of the Experiment Station, the one very outstanding is provision for an opportunity for professional improvement on the part of members of the staff. Just what form this should take is possibly not well defined, but many similar institutions are at present considering it sound economy to provide sabbatical leave. The fact that these provisions are receiving more or less general consideration the country over not only attests their soundness, but also makes it inadvisable for those institutions which have not yet adopted the plan to delay action merely because the immediate cost may seem excessive. It is becoming quite evident that whatever cost is involved might better be met directly by adopting a plan for professional improvement than by eventually meeting an even greater cost through the necessity of having to support a staff less well trained because of not having had this opportunity.

With a gradual increase in the support for the Experiment Station and the consequent increasing use of Station service and agricultural equipment, the fluctuations in costs of operations and the returns from products sold, while perhaps no greater in proportion to the operation involved, will become greater in total amount. It is, therefore, readily conceivable that under our present system of financing, when large sums are involved in operations and when expenses may fluctuate very pronouncedly from season to season, the complexities encountered may easily reach the point where they become sufficiently burdensome to interfere with the best interests of those directly responsible for and interested in investigational work.

Furthermore, where financial support for maintenance is derived from both Federal and State funds, the present system, which does not permit inter-departmental transfers from Federal funds but does permit such transfers from State funds, leads to considerable confusion and misunderstanding not justified on the basis of the small sum of money involved. Unless relief is obtained here through a change in financial system this problem will continue until arrangements can be made to utilize all Federal funds for payment of salary and provide maintenance support from State funds only.

A statement of progress on those Experiment Station projects that have been actively pursued during the past year is intentionally omitted here because it is the plan to publish this separately in the regular biennial report which gives more detail than is permissible here.

F. J. Sievers,
Director of Experiment Station.

TREASURER'S REPORT

I herewith submit the annual report of the Treasurer for the fiscal year ending November 30, 1928.

The State appropriation for current expenses of the institution, including the balance brought forward from the previous year, was $958,696.09. The State also appropriated, with the unexpended balance of the previous year, for special construction and equipment $106,081.78. The Federal Government appropriated, together with the balance of the previous year, $206,291.94, making the total amount available for the year, $1,271,069.81. The total amount expended including refunds was $1,187,381.69 which leaves a balance of $83,688.12. Of this amount, $51,264.86 is from Federal funds; $13,663.35 from Special appropriation funds; and $18,759.91 from current expenses, and of this amount, $14,394.28 is the balance of our fuel account and is carried forward for the purchase of coal up to April 1, 1929. There is a balance of $3,557.28 for which we have outstanding orders amounting to $2,769.56, leaving an unexpended balance of $787.92.

A classification of the State appropriation for the current expenses of the institution is as follows:

	Appropriation	Expenditures
College	$626,615 95	$613,223 08
Experiment Station	98,206 96	97,990 78
Extension Service	92,261 93	91,963 97
Short Courses	73,046 50	70,914 52
Market Garden Field Station	12,731 87	12,703 39
Control Laws	53,125 60	51,987 63
Trustees' Travel	1,200 00	856 94
Printing Reports	1,507 28	295 87
	$958,696 09	$939,936 18

From our Emergency appropriation of $5,000.00, we expended $4,625.08, divided as follows:

Experiment Station Poultry	$842 76
Poultry Disease Law	3,782 32

The receipts of the institution were $244,445.78, an increase over last year of $10,221.10. A comparison of the two years is as follows:

	Receipts for 1928	Receipts for 1927
College	$139,734 89	$147,659 41
Experiment Station	21,916 15	17,009 32
Extension Service	816 33	810 95
Short Courses	16,343 71	14,234 15
Market Garden Field Station	519 86	399 42
Control Laws	65,114 84	54,111 43
	$244,445 78	$234,224 68

Special appropriations for 1928 were as follows:

Q. T. V. Land	$12,000 00
Veterinary Science Lab.	40,000 00
Farm Cottage	7,500 00
Renovation of Farm House	7,500 00
Refrigeration of Fisher Lab.	8,000 00
Equipment at Power Plant	18,000 00
Land at Cranberry Station	800 00
	$93,800 00

Our inventory shows the value of the entire plant at $2,777,428.40, an increase of $78,444.81 over the preceding year.

The Trust fund accounts have increased $6,500.00. $5,000.00 from George H. Barber estate, said fund to be used for the encouragement of general athletics among the student body as a whole. $1,500.00 from Mrs. Ellen Pomeroy Moore, a fund established in memory of her brother, Robert F. Pomeroy, of the class of 1894. The income of this is to be used for the purpose of promoting and replenishing the Horticultural and Landscape Gardening section of the College library. Our total Trust funds amount to $121,986.85.

Our accounts were audited by the State Auditor in January, 1928. Their representatives were on hand on the last day of our fiscal year and balanced our cash and bank balance. We expect they will come very soon and complete the audit.

A complete detail of all expenditures and receipts follows.

Fred C. Kenney,
Treasurer.

STATISTICAL REPORT OF THE TREASURER

For the Fiscal Year ending November 30, 1928

Balance Sheet

			Debit	Credit
1927				
Dec.	1.	To balance on hand	$43,484 78	
1928				
Nov.	30.	To departmental income	244,445 78	
Nov.	30.	Receipts from State Treasurer	747,086 52	
Nov.	30.	To receipts from United States Treasurer	157,408 84	
Nov.	30.	To bills paid by State Treasurer	293,399 90	
Nov.	30.	Refunds transferred to State Treasurer		$2,733 49
Nov.	30.	Expenditures for fiscal year		1,187,381 69
Nov.	30.	Income transferred to State Treasurer		244,445 78
Nov.	30.	Balance on hand		51,264 86
			$1,485,825 82	$1,485,825 82

STATEMENT OF LEGISLATIVE APPORTIONMENT AND EXPENDITURES FOR FISCAL YEAR ENDING NOVEMBER 30, 1928 AND APPORTIONMENT REQUESTED FOR 1929

	Apportionment for Last Fiscal Year		Expenditures		Requested Apportionment for New Fiscal Year	
College:						
Personal Services	$419,309 99		$424,476 60		$447,810 00	
Maintenance	187,864 26		169,091 15		189,825 00	
		$607,174 25		$593,567 75		$637,635 00
Experiment Station:						
Personal Services	$79,200 00		$79,046 01		$80,402 00	
Maintenance	19,006 96		18,944 77		17,798 00	
		98,206 96		97,990 78		98,200 00
Extension Service:						
Personal Services	$57,000 00		$55,537 99		$61,762 00	
Maintenance	35,261 93		36,425 98		39,850 00	
		92,261 93		91,963 97		101,612 00
Short Courses:						
Personal Services	$61,500 00		$60,269 51		$65,040 00	
Maintenance	11,546 50		10,645 01		12,900 00	
		73,046 50		70,914 52		77,940 00
Market Garden Field Station:						
Personal Services	$7,700 00		$7,569 46		$8,400 00	
Maintenance	5,031 87		5,133 93		6,000 00	
		12,731 87		12,703 39		14,400 00
Trustees' Travel	$1,200 00		$856 94		$1,200 00	
Printing Reports	1,507 28		295 87		1,500 00	
		2,707 28		1,152 81		2,700 00
Feed Law	$10,000 00		$9,909 98		$11,100 00	
Fertilizer Law	13,500 00		13,473 39		15,000 00	
Milk Testing Law	800 00		696 51		800 00	
Poultry Disease Law	21,003 00		20,874 93		35,000 00	
Seed Control Law	5,062 60		4,639 82		5,500 00	
Laboratory Service	2,760 00		2,393 00		5,640 00	
		53,125 60		51,987 63		73,040 00
Replacements	$19,441 70	19,441 70	$19,655 33	19,655 33	$35,000 00	35,000 00
Emergency	5,000 00	5,000 00	4,625 08	4,625 08	5,000 00	5,000 00
Totals	. . . .	$963,696 09		$944,561 26		$1,045,527 00
Balance unexpended				19,134 83		
				$963,696 09		

CASH STATEMENT

	Other Funds	State Funds	Totals
Balance December 1, 1927	$43,484 78	–	$43,484 78
Receipts			
College receipts from students and others	–	–	61,940 53
Tuition	–	$36,928 00	–
Laboratory fees	–	6,236 75	–
Rent	–	18,775 78	–
Department Sales	–	–	77,794 36
Products	–	66,070 27	–
Miscellaneous	–	11,724 09	–
Experiment Station	–	–	21,916 15
Cranberry receipts	–	9,922 84	–
Chemical receipts	–	254 59	–
Miscellaneous	–	11,738 72	–
Extension Service	–	–	816 33
Correspondence	–	489 15	–
Miscellaneous	–	327 18	–
Short Courses	–	–	16,343 71
Student fees	–	15,976 71	–
Winter School	–	367 00	–
Market Garden Field Station	–	–	519 86
Produce	–	519 86	–
Feed Law	–	19,443 05	19,443 05
Fertilizer Law	–	15,870 50	15,870 50

	Other Funds	State Funds	Totals
Milk Testing Law	–	$1,056 49	$1,056 49
Poultry Disease Law	–	27,962 40	27,962 40
Seed Control Law	–	306 35	306 35
Laboratory Service	–	–	476 05
Bacteriology	–	388 05	–
Pathology	–	88 00	–
Treasurer of the Commonwealth	–	–	747,086 52
Maintenance	–	728,413 75	–
Special Appropriations	–	13,274 45	–
Endowment	$3,313 32	–	–
Smith-Hughes Fund	2,085 00	–	–
Federal Government	–	–	157,408 84
Land Grant of 1862	7,300 00	–	–
Hatch Fund of 1887	15,000 00	–	–
Morrill Fund of 1890	16,666 67	–	–
Adams Fund of 1906	15,000 00	–	–
Nelson Fund of 1907	16,666 66	–	–
Smith Lever Fund of 1914	31,775 51	–	–
Purnell Fund of 1925	45,000 00	–	–
Capper Ketchum Fund of 1928	10,000 00	–	–
Bills paid by State Treasurer	–	293,399 90	293,399 90
	$206,291 94	$1,279,533 88	$1,485,825 82

Payments

	Other Funds	State Funds	Totals
College Expense	–	–	$639,599 40
Personal Service	$46,031 65	$424,476 60	–
Maintenance	–	169,091 15	–
Experiment Station	–	–	174,327 81
Personal Service	65,292 66	79,046 01	–
Maintenance	11,044 37	18,944 77	–
Extension Service	–	–	124,513 37
Personal Service	31,678 79	55,537 99	–
Maintenance	870 61	36,425 98	–
Short Courses	–	–	71,023 52
Personal Service	–	60,269 51	–
Maintenance	109 00	10,645 01	–
Market Garden Field Station	–	–	12,703 39
Personal Service	–	7,569 46	–
Maintenance	–	5,133 93	–
Trustees' Travel	–	856 94	856 94
Printing Reports	–	295 87	295 87
Replacements	–	19,655 33	19,655 33
Commercial Feedstuffs	–	9,909 98	9,909 98
Fertilizer Law	–	13,473 39	13,473 39
Milk Testing Law	–	696 51	696 51
Poultry Disease Law	–	20,874 93	20,874 93
Seed Control Law	–	4,639 82	4,639 82
Laboratory Service	–	–	2,393 00
Bacteriology	–	1,135 20	–
Pathology	–	1,257 80	–
Special Appropriations	–	–	92,418 43
1926 Certain Barns	–	261 97	–
1927 Emergency Needs	–	1,093 59	–
1927 Construction of steam line	–	5,000 00	–
1927 Library Improvements	–	38 84	–
1927 Equipment Cranberry Station	–	887 38	

Special Appropriations — *Concluded*	Other Funds	State Funds	Totals
1928 Land adjoining campus	–	$12,000 00	–
1928 Emergency Needs	–	4,625 08	–
1928 Veterinary Science Laboratory	–	40,000 00	–
1928 Farm Cottage	–	7,157 06	–
1928 Renovation of Farmhouse	–	6,504 16	–
1928 Refrigeration Fisher Laboratory	–	7,054 35	–
1928 Equipment Power Plant	–	6,996 00	–
1928 Land at Cranberry Station	–	800 00	–
Income	–	244,445 78	$244,445 78
Refunds to State Treasurer	–	2,733 49	2,733 49
Balance	$51,264 86	–	51,264 86
	$206,291 94	$1,279,533 88	$1,485,825 82

BUDGET APPROPRIATION FOR CURRENT EXPENSES FOR YEAR ENDING NOVEMBER 30, 1928

Personal Services:	Appropriation	Current Year	Balances
Administration	$39,700 00	$40,004 08	—$304 08
Instruction	213,000 00	209,809 67	3,190 33
Laboratory Service	2,460 00	2,106 67	353 33
Departmental	79,609 99	81,224 80	—1,614 81
Farm	29,000 00	30,405 60	—1,405 60
Operating	41,000 00	42,376 86	—1,376 86
Repairs Ordinary	17,000 00	20,655 59	—3,655 59
Replacements	1,000 00	2,445 18	—1,445 18
Experiment Station	79,200 00	79,046 01	153 99
Fertilizer Control Law	10,500 00	10,255 69	244 31
Poultry Disease Law	15,000 00	12,537 43	2,462 57
Milk Testing Inspection Law	550 00	390 00	160 00
Commercial Feedstuffs	7,500 00	8,412 70	—912 70
Extension Service	57,000 00	55,537 99	1,462 01
Market Garden Field Station	7,700 00	7,569 46	130 54
Short Courses	61,500 00	60,269 51	1,230 49
Seed Control Work	3,300 00	3,636 75	—336 75
	$665,019 99	$666,683 99	—$1,664 00

Travel	$6,000 00	$6,008 84	—$8 84
Office and other Expenses	32,575 38	33,752 98	—1,177 60
Teaching and Laboratory Supplies	61,072 50	54,109 67	6,962 83
Minor Equipment	6,107 65	8,131 07	—2,023 42
Experiment Station:			
Supplies and Equipment	14,006 96	15,531 87	—1,524 91
Travel	3,500 00	2,146 78	1,353 22
Office Expenses	1,500 00	1,266 12	233 88
Extension Services:			
Supplies and Equipment	15,261 93	16,181 14	—919 21
Travel	20,000 00	20,244 84	—244 84
Market Garden Field Station	5,031 87	5,133 93	—102 06
Short Courses:			
Travel	1,500 00	1,558 26	—58 26
Office and other Expenses	10,046 50	9,086 75	959 75
Heat, Light and Power	67,390 94	52,996 66	14,394 28
Farm	199 69	—2,274 75	2,474 44
Repairs Ordinary	14,518 10	16,366 68	—1,848 58
Replacements	18,441 70	17,210 15	1,231 55

	Appropriation	Current Year	Balances
Fertilizer Control Law:			
Travel	$1,000 00	$1,160 85	—$160 85
Office and other Expenses	2,000 00	2,056 85	—56 85
Poultry Disease Law:			
Travel	3,500 00	2,104 71	1,395 29
Office and other Expenses	2,503 00	6,232 79	—3,729 79
Milk Testing Inspection Law:			
Travel	225 00	260 81	—35 81
Office and other Expenses	25 00	45 70	—20 70
Trustees' Expenses	1,200 00	856 94	343 06
Printing Reports	1,507 28	295 87	1,211 41
Commercial Feedstuffs:			
Travel	700 00	513 23	186 77
Office and other Expenses	1,800 00	984 05	815 95
Laboratory Service	300 00	286 33	13 67
Seed Control Law (office and other expenses)	1,762 60	848 69	913 91
Travel	–	154 38	—154 38
Sub total	$293,676 10	$273,252 19	$20,423 91
Totals	$958,696 09	$939,936 18	$18,759 91
College Department:			
Dean's Office	$12,470 62	$12,199 22	$271 40
Executive Order	10,126 64	10,063 56	63 08
President's Office	19,076 69	19,025 59	51 10
Registrar's Office	–	–	–
Treasurer's Office	19,877 39	19,420 12	457 27
Agricultural Economics	8,814 12	8,864 60	—50 48
Agricultural Education	7,015 00	7,035 95	—20 95
Agronomy	4,857 60	4,994 37	—136 77
Animal Husbandry	4,950 00	4,704 49	245 51
Beekeeping	2,405 00	2,382 68	22 32
Botany	12,934 18	12,945 64	—11 46
Chemistry	20,558 53	20,695 97	—137 44
Dairying	49,814 57	49,622 01	192 56
Economics and Sociology	3,725 00	3,684 96	40 04
Entomology	11,257 46	11,243 56	13 90
Farm	37,984 69	37,501 40	483 29
Farm Management	5,427 50	5,455 65	—28 15
Floriculture	10,881 67	10,529 80	351 87
Forestry	2,840 95	2,786 04	54 91
Freshman Agriculture	2,965 00	2,953 26	11 74
General Agriculture	5,480 00	5,386 72	93 28
General Expense	48 79	7,364 74	—7,315 95
General Horticulture	18,893 89	19,143 48	—249 59
Graduate School	108 99	48 26	60 73
Grounds	10,500 00	10,802 52	—302 52
Horticultural Mfg.	7,140 00	7,072 62	67 38
Hospital	4,318 43	4,779 78	—461 35
Landscape Gardening	7,503 00	7,490 38	12 62
Language and Literature	19,780 00	19,866 34	—86 34
Library	18,235 26	19,131 92	—896 66
Mathematics	6,990 00	6,987 10	2 90
Microbiology	11,680 12	11,885 33	—205 21
Military Science	2,614 66	2,623 79	—9 13
Mount Toby	2,405 95	2,448 05	—42 10
Physical Education	14,974 05	15,184 78	—210 73

College Department — *Concluded*	Appropriation	Current Year	Balances
Physics	$6,825 62	$6,885 33	—$59 71
Operating and Maintenance	157,757 39	137,728 57	20,028 82
Pomology	12,164 99	12,260 43	—95 44
Poultry	25,315 00	25,117 09	197 91
Rural Engineering	5,530 00	5,523 33	6 67
Rural Home Life	12,670 60	12,692 56	—21 96
Rural Sociology	2,930 00	2,948 74	—18 74
Vegetable Gardening	6,950 00	6,739 51	210 49
Veterinary	5,365 00	5,269 64	95 36
Women's Dormitory	4,069 35	4,799 54	—730 19
Zoölogy and Geology	4,670 00	4,531 82	138 18
Salary Surplus	1,566 25	–	1,566 25
Schedule Office	100 00	112 67	—12 67
	$624,569 95	$610,933 91	$13,636 04
Experiment Station Department:			
Administration	$10,062 09	$9,488 18	$573 91
Agricultural Economics	150 00	150 68	—68
Agronomy	6,795 00	6,730 65	64 35
Botany	10,184 22	10,252 75	—68 53
Chemistry	16,055 00	15,807 71	247 29
Cranberry	9,890 00	10,152 08	—262 08
Entomology	8,385 00	8,310 01	74 99
General Horticulture	410 00	410 00	–
Seed Law	5,062 60	4,639 82	422 78
Freight and Express	300 00	164 72	135 28
Library	350 00	366 34	—16 34
Market Garden Field Station	3,006 29	3,006 29	–
Meteorology	1,100 00	1,099 69	31
Microbiology	2,003 33	2,019 42	—16 09
Pomology	7,050 00	6,699 66	350 34
Poultry	9,615 00	9,998 60	—383 60
Station Service	12,845 00	13,332 50	—487 50
Veterinary Science	150 75	547 11	—396 36
Fertilizer Control Law	13,500 00	13,473 39	26 61
Poultry Disease Law	21,003 00	20,874 93	128 07
Milk Testing Inspection Law	800 00	696 51	103 49
Commercial Feedstuffs	10,000 00	9,909 98	90 02
Laboratory Service	2,760 00	2,393 00	367 00
Salary Surplus	456 28	–	456 28
Agric. Engineering	100 00	100 86	—86
Replacement	49 00	–	49 00
	$152,082 56	$150,624 88	$1,457 68
Extension Service Department:			
Administration	$19,565 79	$20,603 75	—$1,037 96
Animal Husbandry	2,496 10	2,256 80	239 30
Clothing	2,909 97	3,836 90	—926 93
Co-op Marketing	4,559 57	4,689 66	—130 09
Correspondence Courses	1,357 92	1,237 22	120 70
County Agents	3,475 55	3,323 25	152 30
Crop Protection	160 15	71 21	88 94
Dairying	336 66	147 62	189 04
Exhibits	2,344 57	2,241 32	103 25
Extension Courses at College	3,925 62	4,145 64	—220 02
Farm Management	2,170 69	2,275 36	—104 67

Extension Service Department — *Concluded*	Appropriation	Current Year	Balances
Forestry	$123 47	$12 10	$110 37
Gardening	2,478 13	2,586 05	—107 92
Home Demonstrations	4,015 22	3,980 79	34 43
Horticultural Manufacturing	3,666 34	3,536 99	129 35
Household Management	3,294 47	3,207 99	86 48
Junior Extension	11,653 83	12,139 21	—485 38
Landscape Gardening	172 47	14 98	157 49
Lectures	150 70	331 07	—180 37
Nutrition	3,713 04	3,211 34	501 70
Pomology	3,523 98	3,436 74	87 24
Poultry Husbandry	3,494 44	3,661 73	—167 29
Printing	7,808 10	8,270 52	—462 42
Rural Engineering	145 00	63 32	81 68
Soils and Crops	3,858 14	3,624 05	234 09
Salary Surplus	1,462 01	–	1,462 01
	$92,861 93	$92,906 61	—$44 68
Miscellaneous:			
Short Courses:			
Agricultural Economics	$1,990 00	$1,970 00	$20 00
Agronomy	4,021 40	4,012 58	8 82
Animal Husbandry	3,699 84	3,621 30	78 54
Dairying	4,750 00	4,790 96	—40 96
Entomology	100 00	57 82	42 18
Farm Management	1,452 50	1,468 05	—15 55
Floriculture	2,451 62	2,408 98	42 64
Forestry	29 08	10 23	18 85
General Horticulture	4,123 04	4,061 86	61 18
Home Economics	1,583 72	1,523 54	60 18
Horticultural Manufacturing	511 85	460 51	51 34
Library	25 00	–	25 00
Microbiology	2,321 00	2,283 36	37 64
Office	24,214 99	24,086 68	128 31
Physical Education	1,990 00	1,986 31	3 69
Pomology	6,697 28	6,542 30	154 98
Poultry	2,660 00	2,516 51	143 49
Rural Engineering	5,590 57	5,586 62	3 95
Treasurer's Office	200 00	199 29	71
Vegetable Gardening	3,800 12	3,731 63	68 49
Salary Surplus	1,230 49	–	1,230 49
Total Short Courses	$73,442 50	$71,318 53	$2,123 97
Market Garden Field Station	$13,031 87	$12,999 44	$32 43
Trustees' Expenses	1,200 00	856 94	343 06
Printing Reports	1,507 28	295 87	1,211 41
Total Miscellaneous	$89,181 65	$85,470 78	$3,710 87
Grand total Maintenance Appropriation	$958,696 09	$939,936 18	$18,759 91

Special Appropriations

	Appropriation	Expenditure to Date	Balance
1926 Certain Barns	$261 97	$261 97	–
1927 Emergency Needs	1,093 59	1,093 59	–
1927 Construction of Steam Line	5,000 00	5,000 00	–
1927 Library Improvements	38 84	38 84	–
1927 Equipment Cranberry Station	887 38	887 38	–[1]
1928 Land Adjoining Campus	12,000 00	12,000 00	–
1928 Emergency Needs	5,000 00	4,625 08	$374 92
1928 Veterinary Science Laboratory	40,000 00	40,000 00	–[1]
1928 Farm Cottage	7,500 00	7,157 06	342 94
1928 Renovation of Farm House	7,500 00	6,504 16	995 84
1928 Refrigeration Fisher Laboratory	8,000 00	7,054 35	945 65
1928 Equipment Power Plant	18,000 00	6,996 00	11,004 00
1928 Land at Cranberry Station	800 00	800 00	–
Totals	$106,081 78	$92,418 43	$13,663 35

College Buildings (Estimated Value, 1928)

	Inventory at Beginning of Year	Per Cent deducted	Value at Beginning of Year less Deterioration	Repairs and Improvements during Year	Total Value at Close of Fiscal Year
Adams Hall	$118,834 81	2	$116,458 11	$706 16	$117,164 27
Agricultural Engineering Building	14,007 43	2	13,727 28	231 12	13,958 40
Apiary	2,760 33	2	2,705 12	8 64	2,713 76
Cashier's House	2,423 95	5	2,302 75	200 98	2,503 73
Chemistry Store House	46 01	2	45 09	–	45 09
Clark Hall	60,023 17	2	58,822 71	606 51	59,429 22
Draper Hall	73,236 61	3	71,039 51	2,101 29	73,140 80
Drill Hall and Gun Shed	25,069 90	5	23,816 40	470 49	24,286 89
Durfee Glass House, old	14,402 78	5	13,682 64	236 43	13,919 07
Durfee Glass House, new	8,786 74	5	8,347 40	3 30	8,350 70
Farm Blacksmith Shop	370 17	3	359 06	–	359 06
Farm Bungalow No. 1	2,802 88	3	2,718 79	67 02	2,785 81
Farm Bungalow No. 2	4,052 34	3	3,930 77	69 61	4,000 38
Farm Bungalow No. 3	3,975 70	3	3,856 43	83 39	3,939 82
Farm Bungalow Garage	350 00	5	332 50	–	332 50
Farm Bull Pens and Fence	3,902 24	5	3,707 13	2 55	3,709 68
Farm Corn Cribs (7)	650 00	5	617 50	–	617 50
Farm Dairy Barns and Storage	28,223 83	3	27,377 12	403 23	27,780 35
Farm Horse Barn No. 1	4,779 55	3	4,636 16	100 29	4,736 45
Farm Horse Barn No. 2	–	5	–	–	5,293 51
Farm House	3,623 20	3	3,514 50	400 87	3,915 37
Farm Machinery Barn	3,422 62	3	3,319 94	3 60	3,323 54
Farm Piggery	2,495 06	3	2,420 21	7 48	2,427 69
Farm Sheep Barn	1,475 77	3	1,431 50	6 29	1,437 79
Farm Young Stock, including Isolation and Quarantine Barns	18,935 13	3	18,367 08	137 13	18,504 21
Fernald Hall	66,700 48	2	65,366 47	1,913 72	67,280 19
Fisher Laboratory	9,548 46	2	9,357 49	7,114 54	16,472 03
Flint Laboratory	68,632 04	2	67,259 40	1,144 71	68,404 11
French Hall	44,382 92	2	43,495 26	220 84	43,716 10
Goessmann Laboratory	274,325 44	2	268,838 93	1,886 31	270,725 24
Grinnell Arena	8,427 07	2	8,258 53	215 09	8,473 62
Grounds Tool Shed	155 36	5	147 59	–	147 59
Harlow House	1,740 11	5	1,653 10	27 36	1,680 46
Head of Division of Horticulture	2,998 46	5	2,848 54	120 14	2,968 68
Home Practice House for Girls	1,870 19	5	1,776 68	6,350 66	8,127 34
Horticultural Barn	3,672 71	3	3,562 53	172 87	3,735 40
Horticultural Garage	1,358 10	3	1,317 36	13 60	1,330 96
Horticultural Tool Shed	4,756 07	3	4,613 39	45 71	4,659 10
Horticultural Open Shed	362 27	5	344 14	–	344 14
Horticultural Manufactures Shed	2,669 25	5	2,535 79	29 45	2,565 24
Hospital	15,822 00	2	15,505 56	166 57	15,672 13
Jewett House and Barn	2,855 35	5	2,712 58	48 09	2,760 67
Library	29,832 50	2	29,235 85	777 23	30,013 08
Market Garden Field Station Greenhouse	13,445 60	2	13,176 69	–	13,176 69
Market Garden Field Station Office and Laboratory Buildings	7,683 20	2	7,529 54	–	7,529 54

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[1] Reverted to State Treasurer.

College Buildings (Estimated Value, 1928) — *Concluded*

	Inventory at Beginning of Year	Per Cent deducted	Value at Beginning of Year less Deterioration	Repairs and Improvements during Year	Total Value at Close of Fiscal Year
Market Garden Field Station Farmhouse	$5,179 18	5	$4,920 22	$87 71	$5,007 93
Market Garden Field Station Ice House	85 74	5	81 45	–	81 45
Market Garden Field Station Large Cow Barn	7,716 37	5	7,330 55	–	7,330 55
Market Garden Field Station Small Stock Barn	1,714 75	5	1,629 01	–	1,629 01
Market Garden Field Station Small Shed	678 30	5	644 38	–	644 38
Mathematics Building	4,493 60	5	4,268 92	618 21	4,887 13
Memorial Building	95,766 69	2	93,851 36	491 11	94,342 47
Microbiology Building	53,047 33	2	51,986 38	804 72	52,791 10
Military Storage	157 56	5	149 68	–	149 68
Mount Toby House and Barn	2,821 40	5	2,680 37	–	2,680 37
North Dormitory	29,529 29	2	28,938 70	922 47	29,861 17
Paige Laboratory and Stable	22,691 94	2	22,238 10	2,405 16	24,643 26
Physics Laboratory	8,992 80	5	8,543 16	78 55	8,621 71
Poultry Department:					
No. 1, Demonstration Building	2,253 64	2	2,208 57	14 92	2,223 49
No. 2, Oil House	144 44	2	141 55	60	142 15
No. 3, Brooder, killing and fattening Laboratory	2,986 38	2	2,926 65	30 71	2,957 36
No. 4, Mechanics storage building and incubator cellar	4,010 14	2	3,929 94	52 03	3,981 97
No. 5, Laying House	1,691 38	2	1,657 55	109 73	1,767 28
No. 6, Manure Shed	132 07	2	129 43	3 56	132 99
No. 7, Small Henhouse	46 67	2	45 74	6 36	52 10
No. 8, Breeding House	1,360 65	2	1,333 44	30 18	1,363 62
No. 9, Experimental Breeding House	597 88	2	585 92	33 26	619 18
No. 10, Duck House	87 81	2	86 05	24 04	110 09
No. 11, Unit house for 200 hens	421 04	2	412 62	30 54	443 16
No. 12, Unit house for 100 hens	392 95	2	385 09	27 72	412 81
No. 13, Experimental house	310 02	2	303 82	11 71	315 53
Power Plant and storage buildings including Coal Pocket	47,159 06	2	46,215 88	593 44	46,809 32
President's House	14,617 83	3	14,179 30	424 04	14,603 34
South Dormitory	44,018 57	2	43,138 20	1,122 97	44,261 17
Stockbridge Hall	152,920 54	2	149,862 13	1,741 25	151,603 38
Agronomy Greenhouse and Storage	4,633 87	2	4,541 19	21 40	4,562 59
Stockbridge House	1,901 35	5	1,806 28	7 12	1,813 40
Stable for Cavalry Unit	13,194 33	2	12,930 44	278 14	13,208 58
Blacksmith Shop	686 00	2	672 28	–	672 28
Storage Barn	2,820 94	2	2,764 52	40 46	2,804 98
Turbine House	16,419 15	2	16,090 77	79 38	16,170 15
Vegetable Plant House	4,615 56	5	4,384 78	289 35	4,674 13
Waiting Station	687 22	2	673 48	4 45	677 93
Wilder Hall	30,378 61	2	29,771 04	509 38	30,280 42
	$1,541,250 85	–	$1,505,510 06	$36,987 94	$1,542,498 00

Experiment Station Buildings (Estimated Value)

	Inventory at Beginning of Year	Per Cent deducted	Value at Beginning of Year less Deterioration	Repairs and Improvements during Year	Total Value at Close of Fiscal Year
Agricultural Laboratory	$13,646 84	2	$13,373 90	$704 90	$14,078 80
Agricultural Barn	6,083 38	3	5,900 88	8 64	5,909 52
Agricultural Farmhouse[1]	–	5	–	–	7,500 00
Agricultural Glasshouse	953 59	5	905 91	–	905 91
Brooks House	2,941 17	5	2,794 11	127 51	2,921 62
Brooks Barn and Sheds	1,163 05	5	1,104 90	8 10	1,113 00
Brooks Tobacco Barn	2,575 07	5	2,446 32	–	2,446 32
Cranberry Buildings:					
Laboratory	6,174 00	2	6,050 52	–	6,050 52
Garage	1,287 83	2	1,262 07	60 00	1,322 07
Shed (Storage)	270 00	10	243 00	–	243 00
Pump house	156 75	5	148 91	–	148 91
Oil house	38 00	5	36 10	–	36 10

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[1] Replaced by new house.

EXPERIMENT STATION BUILDINGS (ESTIMATED VALUE) — *Concluded*

	Inventory at Beginning of Year	Per Cent deducted	Value at Beginning of Year less Deterioration	Repairs and Improvements during Year	Total Value at Close of Fiscal Year
Entomological glasshouses . .	$476 49	5	$452 67	$3 50	$456 17
Plant and Animal Chemistry Lab. .	26,294 19	2	25,768 31	777 92	26,546 23
Plant and Animal Chemistry Barns	6,341 41	3	6,151 17	370 78	6,521 95
Plant and Animal Dairy . .	1,604 46	3	1,556 33	–	1,556 33
Six Poultry Houses . . .	648 24	2	635 28	–	635 28
Tillson Cottage	986 59	5	937 26	114 24	1,051 50
Tillson Barn	894 76	5	850 02	–	850 02
Tillson Poultry Houses (4), Nos. 1, 2, 3, 4	2,734 71	2	2,680 02	146 25	2,826 27
Tillson Pullet brooder No. 5 .	961 90	5	913 80	33 20	947 00
Tillson hen brooder No. 6 . .	1,004 46	5	954 24	32 85	987 09
Tillson Summer Sheds (3), 7, 8, 9 .	377 34	5	358 47	15 35	373 82
Tillson Foreman's quarters and Incubator cellar No. 10 . .	6,713 43	2	6,579 16	5 15	6,584 31
	$84,327 66	–	$82,103 35	$2,408 39	$84,511 74

COLLEGE EQUIPMENT (ESTIMATED VALUE)

Administrative division:	
Dean's Office and Schedule Room	$1,890 40
President's Office	3,217 78
Treasurer's Office	4,361 75
Agricultural division:	
Agricultural Engineering	10,748 75
Agronomy	9,936 80
Animal Husbandry	871 02
Dairy	25,848 41
Farm, including Livestock	67,234 32
Farm Management	1,522 34
Freshman Agriculture	244 83
General Agriculture	2,618 38
Poultry	8,970 80
Rural Home Life	4,538 30
Dining Hall	26,485 57
Extension Service	19,810 50
General Science:	
Apiary	2,584 83
Bacteriology and Physiology	32,624 20
Botanical	25,842 95
Chemistry	34,580 08
Entomology	6,551 33
Mathematics	2,331 75
Physics	11,408 96
Veterinary	15,358 72
Zoölogy and Geology	18,329 91
Graduate School	168 30
Horticultural division:	
Floriculture	40,519 27
Forestry	364 91
General Horticulture	6,981 23
Grounds	2,730 57
Horticultural Manufactures	7,015 55
Landscape Gardening	6,298 36
Market Garden Field Station	4,084 09
Mount Toby Reservation	303 33
Pomology	8,262 25
Vegetable Gardening	3,671 18

Hospital	$1,053 80
Humanities division:	
Economics and Sociology	39 00
Languages and Literatures	750 80
Library	160,851 48
Memorial Hall	13,380 50
Military	2,252 36
Operating and Maintenance:	
College supplies	1,020 53
Janitor supplies	1,393 94
Fire Apparatus	1,781 67
General Maintenance:	
Office	700 33
Carpentry and Masonry supplies	3,228 28
Carpentry and Masonry Tools	4,414 35
Electrical supplies	4,384 94
Electrical Tools	187 83
Electrical supplies for Commencement	386 67
Heating and Plumbing supplies	8,936 99
Heating and Plumbing tools	2,308 60
Painting supplies	1,072 65
Painting Tools	197 80
Steam Main	11,703 22
Lighting Lines	11,894 73
Sewer Line	12,741 87
Water Main	15,444 02
Roads and Walks	46,178 42
Power Plant:	
General Equipment	85,955 46
Tools	225 26
Supplies	100 90
Fuel	14,411 96
Physical Education	1,608 04
Rural Social Science:	
Agricultural Economics	1,985 90
Agricultural Education	1,933 73
Rural Sociology	188 19
Short Courses	2,725 50
Women's Dormitory	9,897 36
Social Union and Trophy Room	594 75
Text Books	1,769 74
Total	$846,013 29

EXPERIMENT STATION EQUIPMENT (ESTIMATED VALUE)

Agricultural Economics	$709 52
Agricultural Engineering	208 50
Agricultural Laboratory	9,504 23
Agronomy	728 39
Bacteriology and Physiology	4,566 23
Botany	9,385 61
Cranberry Station	13,046 34
Director's Office	5,867 32
Entomology Laboratory	25,169 17
Entomology at Market Garden Field Station	342 75
Feed and Fertilizer Law	12,155 38
Meteorological Observatory	509 35
P & A Chemistry	19,029 87
Pomology	5,856 81

Poultry	$6,155 65
Poultry Disease Law	10,518 19
Treasurer's Office	728 50
Veterinary	596 98
Laboratory Service:	
Pathology	123 08
Seed Law	2,510 42
	$127,712 29

INVENTORY — REAL ESTATE

Angus Land	$800 00
Allen Place	500 00
Baker Place	2,500 00
Bangs Place	2,350 00
Brooks Farm	11,000 00
Brown Land	500 00
Charmbury Place	450 00
Clark Place	4,500 00
College Farm	37,000 00
Cranberry Land	16,300 00
George Cutler, Jr., Trustee	2,700 00
Dickinson Land	7,850 00
Harlow Farm and Orchard	3,284 63
Hawley and Brown Place	675 00
Kellogg Place	3,368 45
Loomis Place	415 00
Louisa Baker Place	5,000 00
Market Garden Field Station	21,000 00
Mount Toby Demonstration Forest	30,000 00
Newell Farm	2,800 00
Old Creamery Place	1,000 00
Owen Farm	5,000 00
Pelham Quarry	500 00
Q. T. V. Land	12,000 00
Tillson Farm	2,950 00
Westcott Land	2,250 00
	$176,693 08

	Acres
College estate (area)	705.59
Cranberry station, Wareham (area)	28.36
Market Garden Field Station, Waltham (area)	55.39
Mount Toby demonstration forest (area)	755.27
Rifle Range	46.20
Pelham Quarry	.50
	1,591.31

SUMMARY

Land	$176,693 08
College Buildings	1,542,498 00
College Equipment	846,013 29
Experiment Station Buildings	84,511 74
Experiment Station Equipment	127,712 29
Total	$2,777,428 40

DINING HALL STATEMENT NOVEMBER 30, 1928

Balance, Dec. 1, 1927	$3,556 38	
Total Disbursements, Dec. 1, 1927 to Dec. 1, 1928	117,216 25	
Outstanding Bills, Nov. 30, 1928	862 53	
Total Collections, Dec. 1, 1927 to Dec. 1, 1928		$130,649 86
Outstanding Accounts, Nov. 30, 1928:		
Board		395 98
Special Service		176 05
Inventory, Nov. 30, 1928		7,411 86
Balance	16,998 59	
	$138,633 75	$138,633 75

Special Funds

Burnham Emergency Fund

	Market Value Dec. 1, 1928	Par Value	Income
One bond Indianapolis Water Works Securities 5s	$490 00	$500 00	$12 50
One bond Jersey Central Power and Light Co. 5½s	505 00	500 00	27 50
Two bonds Narragansett Co. 5s @ 100	2,000 00	2,000 00	100 00
Two bonds Power Corp. of New York 6½s @ 104	2,080 00	2,000 00	130 00
	$5,075 00	$5,000 00	$270 00
Unexpended balance Dec. 1, 1927	–	–	169 67
Earnings from exchange of bonds	–	–	3 75
Amherst Savings Bank	–	–	12 50
	–	–	$455 92
Disbursements for fiscal year ending Nov. 30, 1928	–	–	71 32
Cash on hand Nov. 30, 1928	–	–	$384 60

Library Fund

One bond Cities Service Power and Light 5½s	$980 00	$1,000 00	$27 50
Four bonds Illinois Power and Light Corp. 5s @ 96	3,840 00	4,000 00	–
Five Bonds New York Central & Hudson River R.R. 4s @ 96	4,800 00	5,000 00	200 00
Two shares New York Central stock at 190	380 00	200 00	16 00
Amherst Savings Bank deposit	175 52	175 52	8 84
	$10,175 52	$10,375 52	$252 34
Lake Shore and Mich. Southern (5)	–	–	200 00
Sale of N. Y. Central Rights	–	–	11 85
Earnings from exchange of bonds	–	–	157 15
	–	–	$621 34
Disbursements for fiscal year ending Nov. 30, 1928	–	–	619 77
Cash on hand Nov. 30, 1928	–	–	$1 57

Endowed Labor Fund (Gift of a Friend of the College)

Two bonds Cities Service Power & Light 5½s @ 98	$1,960 00	$2,000 00	$55 00
One bond Jersey Central Power & Light 5½s	1,010 00	1,000 00	55 00
Two bonds Narragansett Company 5s @ 100	2,000 00	2,000 00	100 00
One bond New York Central & Hudson River 4s	960 00	1,000 00	40 00
One bond State & Washington Buildings 5s	980 00	1,000 00	25 00
Amherst Savings Bank Deposit	1,143 39	1,143 39	58 42
	$8,053 39	$8,143 39	$333 42
Unexpended balance Dec. 1, 1927	–	–	825 10
Indiana Hydro-Electric Power Co.	–	–	30 00
Lake Shore Michigan Southern	–	–	80 00
Earnings from exchange of bonds	–	–	175 93
	–	–	$1,444 45
Disbursements for fiscal year ending Nov. 30, 1928	–	–	42 78
	–	–	$1,401 67

Whiting Street Scholarship Fund

One bond New York Central & Hudson River	$960 00	$1,000 00	$40 00
Amherst Savings Bank deposit	771 64	771 64	39 32
	$1,731 64	$1,771 64	$79 32
Unexpended balance Dec. 1, 1927	–	–	196 08
Cash on hand November 30, 1928	–	–	$275 40

Hills Fund

	Market Value Dec. 1, 1928	Par Value	Income
Boston & Albany R.R. stock $3\frac{5}{8}$s @ 185	$671 00	$362 00	$31 68
One bond Great Western Power 5½s	1,000 00	1,000 00	55 00
One bond Indianapolis Water Works Securities 5s	980 00	1,000 00	25 00
One bond Monongahela West Penn Pub. service 5½s	1,000 00	1,000 00	55 00
One bond Narragansett Company 5s	1,000 00	1,000 00	50 00
One bond New York Central 4s	960 00	1,000 00	40 00
One bond Oklahoma Gas & Elec. Co. 6s	1,020 00	1,000 00	60 00
Three bonds Pacific Tel. & Tel. Co. 5s @ 103	3,090 00	3,000 00	150 00
Prudence Bonds Corporation $1\frac{9}{50}$ bonds 5½s @ 97	1,140 00	1,180 00	64 90
One bond State & Washington Bldg. 5%	980 00	1,000 00	25 00
Amherst Savings Bank	2,572 75	2,572 75	156 65
One bond New York Central & Hudson River 4s	960 00	1,000 00	40 00
	$15,373 75	$15,114 75	$753 23
Unexpended balance December 1, 1927	–	–	428 38
Earnings from exchange of bonds	–	–	184 88
	–	–	$1,366 49
Disbursements for fiscal year ending November 30, 1928	–	–	310 97
Cash on hand November 30, 1928	–	–	$1,055 52

Mary Robinson Fund

Boston & Albany R.R. stock $\frac{3}{8}$ shares @ 185	$69 00	$38 00	$3 32
Prudence Bonds Corporation $\frac{41}{50}$ bonds @ 97	800 00	820 00	45 10
Amherst Savings Bank Deposit	142 00	142 00	7 18
	$1,011 00	$1,000 00	$55 60
Unexpended balance December 1, 1927	–	–	269 18
Earnings from exchange of bonds	–	–	26 52
	–	–	$351 30
Disbursements for fiscal year ending November 30, 1928	–	–	125 00
Cash on hand November 30, 1928	–	–	$226 30

Grinnell Prize Fund

Ten shares New York Central Stock @ 190	$1,900 00	$1,000 00	$80 00
Unexpended balance December 1, 1927	–	–	367 64
Sale of New York Central Rights	–	–	59 23
	$1,900 00	$1,000 00	$506 87
Disbursements for prizes	–	–	50 00
	–	–	$456 87

Gassett Scholarship

One bond New York Central & Hudson River 4s	$960 00	$1,000 00	$40 00
Amherst Savings Bank	511 64	511 64	26 15
	$1,471 64	$1,511 64	$66 15
Unexpended balance December 1, 1927	–	–	185 68
	–	–	$251 83
Disbursements for scholarship	–	–	250 00
Cash on hand November 30, 1928	–	–	$1 83

Massachusetts Agricultural College (Investment)

Three shares New York Central R.R. stock @ 190	$570 00	$300 00	$24 00
Sale of New York Central Rights	–	–	17 76
Cash on hand November 30, 1928	–	–	$41 76

Danforth Keyes Bangs Fund

Two bonds Narragansett Company 5s @ 100	$2,000 00	$2,000 00	$100 00
Two bonds Pacific Telephone & Telegraph Co. 5s @ 103	2,060 00	2,000 00	100 00
One bond State & Washington Bldgs. 5s	980 00	1,000 00	25 00
Two bonds Union Electric Light and Power Co. 5s @ 101	2,020 00	2,000 00	100 00
Interest from Student Loans	–	–	208 72
	$7,060 00	$7,000 00	$533 72
Unexpended balance December 1, 1927	–	–	1,096 32
Indiana Hydro-Electric Power Co.	–	–	30 00
Earnings from exchange of bonds	–	–	113 09
	–	–	$1,773 13
Total loans made to students during fiscal year, $5,270.50	–	–	–
Cash received on account of student loans, $5,263.75	–	–	–
Excess of loans made over accounts paid by students	–	–	6 75
Cash on hand November 30, 1928	–	–	$1,766 38

John C. Cutter Fund

	Market Value Dec. 1, 1928	Par Value	Income
One bond Pacific Telephone & Telegraph Co. 5s	$1,030 00	$1,000 00	$50 00
Unexpended balance December 1, 1927	–	–	180 78
	$1,030 00	$1,000 00	$230 78
Disbursements for fiscal year ending November 30, 1928	–	–	115 04
Cash on hand November 30, 1928	–	–	$115 74

William R. Sessions Fund

Three bonds Indianapolis Water Works Securities 5s @ 98	$2,450 00	$2,500 00	$62 50
Five shares New York Central stock @ 190	950 00	500 00	40 00
One bond Power Corporation of New York 5½s	990 00	1,000 00	55 00
One bond Southern Illinois Light and Power Co. 6s	1,010 00	1,000 00	60 00
	$5,400 00	$5,000 00	$217 50
Unexpended balance Dec. 1, 1927	–	–	205 49
Earnings from exchange of bonds	–	–	12 16
Sale of New York Central Rights	–	–	29 62
Amherst Savings Bank	–	–	62 50
	–	–	$527 27
Disbursements for fiscal year ending Nov. 30, 1928	–	–	80 00
Cash on hand November 30, 1928	–	–	$447 27

Alvord Dairy Scholarship Fund

Two bonds Great Western Power 5½s @ 100	$2,000 00	$2,000 00	$110 00
One bond Indianapolis Water Works Securities 5s	980 00	1,000 00	25 00
One bond Jersey Central Power & Light Co. 5½s	1,010 00	1,000 00	55 00
Amherst Savings Bank deposit	750 00	750 00	69 63
	$4,740 00	$4,750 00	$259 63
Unexpended balance Dec. 1, 1927	–	–	26 84
Earnings from exchange of bonds	–	–	4 86
Amherst Savings Bank, taken from accumulated earnings	–	–	250 00
	–	–	$541 33
Disbursements for fiscal year ending November 30, 1928	–	–	482 01
Cash on hand November 30, 1928	–	–	$59 32

J. D. W. French Fund

Two bonds Great Western Power 5½s @ 100	$2,000 00	$2,000 00	$110 00
Two bonds Jersey Central Power and Light Co. 5½s @ 101	2,020 00	2,000 00	110 00
Four bonds Oklahoma Gas & Electric Co. 6s @ 102	4,080 00	4,000 00	240 00
Two bonds Southern Illinois Light & Power Co. 6s @ 101	2,020 00	2,000 00	120 00
Amherst Savings Bank deposit	500 00	500 00	25 60
	$10,620 00	$10,500 00	$650 60
Unexpended balance Dec. 1, 1927	–	–	493 79
	–	–	$1,099 39
Disbursements for fiscal year ending Nov. 30, 1928	–	–	501 08
Cash on hand November 30, 1928	–	–	$598 31

F. G. Crane Fund

Five bonds Illinois Power & Light Corporation 6s @ 103	$5,150 00	$5,000 00	$300 00
Five bonds Jersey Central Power & Light Co. 5½s @ 101	5,050 00	5,000 00	275 00
Four bonds Monongahela West Penn. Pub. Service 5½s @ 100	4,000 00	4,000 00	220 00
Four bonds Northern New York Utilities 6s @ 103	4,120 00	4,000 00	240 00
Two bonds Power Corporation of N. Y. 6½s @ 104	2,080 00	2,000 00	130 00
Five bonds Tide Water Power Company 5½s @ 97	4,850 00	5,000 00	275 00
Amherst Savings Bank	250 00	250 00	12 65
	$25,500 00	$25,250 00	$1,452 65
Unexpended balance Dec. 1, 1927	–	–	1,905 01
	–	–	$3,357 66
Cancelled notes and cash scholarships	–	–	1,338 34
Cash on hand November 30, 1928	–	–	$2,019 32

Charles A. Gleason Fund

Five bonds Prudence & Company 5½s @ 97	$4,850 00	$5,000 00	$275 00
Unexpended balance Dec. 1, 1927	–	–	62
Cash on hand November 30, 1928	–	–	$275 62

Porter L. Newton Fund

	Market Value Dec. 1, 1928	Par Value	Income
Eight bonds Brown Company 5½s @ 100	$8,000 00	$8,000 00	$440 00
Five bonds Illinois Power & Light Corporation 5½s @ 99	4,950 00	5,000 00	275 00
Five bonds Puget Sound Power & Light 5½s @ 102	5,100 00	5,000 00	275 00
Five bonds Virginia Electric & Power Co. 5s @ 100	5,000 00	5,000 00	250 00
Amherst Savings Bank deposit	411 33	411 33	23 55
	$23,461 33	$23,411 33	$1,263 55
Unexpended balance Dec. 1, 1927	–	–	737 96
Amherst Savings Bank	–	–	107 50
	–	–	$2,109 01
Cash scholarships	–	–	740 00
Cash on hand November 30, 1928	–	–	$1,369 01

George H. Barber Fund

	Market Value Dec. 1, 1928	Par Value	Income
Five bonds Florida Power & Light Com. 5s @ 93	$4,650 00	$5,000 00	$250 00
Amherst Savings Bank	–	–	21 33
	$4,650 00	$5,000 00	$271 33
Charge in connection of purchasing bonds	–	–	5 56
Cash on hand November 30, 1928	–	–	$265 77

Robert F. Pomeroy Library Fund

	Market Value Dec. 1, 1928	Par Value	Income
Two bonds Indiana Hydro-Electric Power Co. 5s @ 96	$1,440 00	$1,500 00	$15 62
Earnings in purchase of bonds	–	–	22 50
Cash on hand November 30, 1928	–	–	$38 12

TRUST ACCOUNT

Massachusetts Agricultural College Club — Student Loan Fund

	Market Value Dec. 1, 1928	Par Value	Income
	$500 00	$500 00	–
Total Loans	–	410 50	–
Amount available for loans	–	$89 50	–
Unexpended balance Dec. 1, 1927	–	–	$51 36
Interest from Loans	–	–	20 50
	–	–	$71 86

4-H Club for Boys

	Market Value Dec. 1, 1928	Par Value	Income
	$1,000 00	$1,000 00	–
Total Loans	–	100 00	–
Amount available for loans	–	$900 00	–
Interest from Loans	–	–	$9 45

4-H Club for Girls

	Market Value Dec. 1, 1928	Par Value	Income
	$100 00	$100 00	–
Total Loans	–	100 00	–
	–	–	–

SUMMARY OF BALANCE ON HAND OF THE INCOME FROM FUNDS HELD IN TRUST BY THE M. A. C.

Burnham Emergency Fund	$384 60
Library Fund	1 57
Endowed Labor Fund	1,401 67
Whiting Street Scholarship Fund	275 40
Hills Fund	1,055 52
Mary Robinson Fund	226 30
Grinnell Prize Fund	456 87
Gassett Scholarship Fund	1 83
Massachusetts Agricultural College Investment Fund	41 76
Danforth Keyes Bangs Fund	1,766 38
John C. Cutter Fund	115 74
William R. Sessions Fund	447 27
Alvord Dairy Scholarship Fund	59 32

J. D. W. French Fund	$598 31
F. G. Crane Fund	2,019 32
Charles A. Gleason Fund	275 62
Porter L. Newton Fund	1,369 01
Geo. H. Barber Fund	265 77
Robert F. Pomeroy Library Fund	38 12
	$10,800 38
M. A. C. Club	161 36
4-H Club for Boys	909 45
	$11,871 19

I hereby certify that I have this day examined the Massachusetts Agricultural College Account, as reported by the Treasurer, Fred C. Kenney, for the year ending November 30, 1928. All bonds and investments are as represented in the Treasurer's report. All disbursements are properly vouched for, and all cash balances are found to be correct.

Frank Gerrett,
Auditor.

STATISTICS

Table I. — New Appointments

A. In the Academic Departments

Stenographer, President's Office: Alice J. Alley.
Clerk, Treasurer's Office: A. Vida Bentley.
Instructor in Chemistry: Joseph S. Butts, B.S., University of Florida, 1926; M.S., Fordham University, 1928.
Junior Library Assistant: Joan L. Cooke.
Clerk, Treasurer's Office: Beatrice E. Dolloff.
Clerk, Power Plant: Mrs. Adella C. Eva.
Instructor in English: Maxwell H. Goldberg, B.S., Massachusetts Agricultural College, 1928.
Stenographer, President's Office: Edna E. Kahler.
Laboratory Assistant in Chemistry: Majel M. MacMasters, B.S., Massachusetts Agricultural College, 1926; M.S., 1928.
Matron, Women's Dormitory: Mrs. Maud Marshall.
Clerk, Power Plant: Bertha E. Palmer.
Stenographer, Division of Horticulture: Ida Ryder.

B. In the Experiment Station

Laboratory Assistant, Pomology: Rena L. Barton.
Laboratory Assistant, Home Economics: Cornelia B. Church, B.S., Massachusetts Agricultural College.
Stenographer, Market Garden Field Station: Mary F. Lally.
Stenographer, Chemistry: Julia D. Millington.
Assistant Research Professor of Agricultural Economics: David Rozman, A.B., University of Wisconsin, 1923; M.A., 1925.
Director, Experiment Station: Fred J. Sievers, B.S., University of Wisconsin, 1910; M.S., 1922.
Assistant Research Professor of Dairying: Kenneth E. Wright, B.S., University of Illinois, 1925; M.S., 1927.

C. In the Control Service

Stenographer, Seed Law Control: Clarice L. Beane.
Assistant Veterinary Pathologist: Glen L. Dunlap, D.V.M., Kansas State College, 1928.
Assistant Bacteriologist: Ralph L. France, B.S., University of Delaware, 1925.

D. In the Extension Service

Assistant State Leader of Home Economics Clubs: Helen Doane.
Extension Specialist in Agronomy: Ralph W. Donaldson, B.A., Acadia University, 1912; B.S.A., Ontario Agricultural College, 1915.
Clerk: Mrs. Julia M. Howes.
Assistant State Leader of County Club Agents: Harley A. Leland, B.S.A., University of Vermont, 1920.
Stenographer: Mrs. Frank W. Prescott.
Stenographer: Mrs. Hattie W. Warren.
Clerk: Olive B. Widber.

E. In the Short Courses

Instructor in Agronomy: Harold R. Knudsen, B.S., Brigham Young University, 1927.

TABLE II. — SPEAKERS FOR THE YEAR

A. Speakers at Assembly for the Year ending Nov. 30, 1928

1927	
Dec. 1.	E. O. Jacobs, Head of Y. M. C. A. in Near East.
Dec. 8.	President C. Telford Erickson, Albanian Agricultural College.
1928	
Jan. 4.	Rev. C. E. Holmes, Hadley, Mass.
Jan. 11.	Student Forum.
Jan. 18.	John Chandler, Sterling Junction, Mass.
Jan. 25.	Professor Laurence B. Packard, Amherst College.
Feb. 1.	Rev. Vincent G. Burns, Pittsfield, Mass.
Feb. 8.	Dr. U. P. Hedrick, Vice Director, New York Experiment Station.
Feb. 15.	President Roscoe W. Thatcher, M. A. C.
Feb. 29.	Professor Francisco Pinol, Connecticut College, New London, Conn.
Mar. 7.	Dr. Tehyi Hsieh, Director Chinese Trade Bureau, Boston, Mass.
Mar. 28.	President Roscoe W. Thatcher, M. A. C.
Apr. 4.	Charles H. Corbett, Secretary, Christian World Educational Committee, New York City.
Apr. 11.	Leslie R. Smith, Massachusetts Department of Agriculture, Boston, Mass.
Apr. 18.	Professor Curry S. Hicks, M. A. C.
Apr. 25.	Professor Frank A. Waugh, M. A. C.
May 2.	Student Forum.
May 9.	Dr. Frank P. Graves, Commissioner of Education, New York.
May 16.	Alden G. Alley, League of Nations Non-Partisan Association.
May 23.	Burnham Declamation Contest.
Sept. 19.	President Roscoe W. Thatcher, M. A. C.
Sept. 27.	Rev. Edwin Bradford Robinson, Holyoke, Mass.
Oct. 4.	Mrs. Lucia Ames Mead, Brookline, Mass.
Oct. 11.	Director Fred J. Sievers, M. A. C.
Oct. 25.	John Mills, Bell Telephone Laboratories, New York City.
Nov. 1.	Dr. Charles H. Herty, The Chemical Foundation, New York City.
Nov. 8.	Dr. C. Telford Erickson, Albanian Agricultural College.
Nov. 15.	Brent Dow Allinson, International House, New York City.

B. Speakers at Sunday Chapel for Year ending Nov. 30, 1928.

1927	
Dec. 4.	President Elliot Speer, Northfield School, Northfield, Mass.
Dec. 11.	Dr. Nehemiah Boynton, Newton Center, Mass.
1928	
Jan. 8.	Rev. K. C. MacArthur, Town and Country Secretary, Massachusetts Federation of Churches.
Jan. 15.	Rev. Charles A. Wing, Church of the Unity, Springfield, Mass.
Jan. 22.	Rev. Hugh Black, Union Theological Seminary, New York City.

1928
Jan. 29. Dr. D. Brewer Eddy, American Board of Commissioners for Foreign Missions.
Feb. 5. Principal Alfred E. Stearns, Andover Academy.
Feb. 12. Rev. J. Elliot Ross, C.S.P., Catholic Bishop, Columbia University.
Feb. 19. Rev. Arthur L. Kinsolving, Grace Episcopal Church, Amherst, Mass.
Mar. 4. Dr. James Gordon Gilkey, South Congregational Church, Springfield, Mass.
Mar. 11. Professor Harold E. B. Speight, Dartmouth College, Hanover, N. H.
Nov. 4. Dr. George R. Baker, Board of Education of Northern Baptist Convention.
Nov. 11. Dr. James Gordon Gilkey, South Congregational Church, Springfield, Mass.
Nov. 18. Dr. D. Brewer Eddy, American Board of Commissioners for Foreign Missions.
Nov. 25. Rev. K. C. MacArthur, Town and Country Secretary, Massachusetts Federation of Churches.

TABLE III. — ATTENDANCE

	REGISTRATION NOV. 1, 1927			REGISTRATION NOV. 1, 1928		
	Men	Women	Total	Men	Women	Total
A. In the Work of College Grade						
Graduate Students	34	6	40	38	8	46
Senior Class	95	21	116	82	23	105
Junior Class	84	25	109	100	27	127
Sophomore Class	115	31	146	114	34	148
Freshman Class	143	43	186	170	48	218
Special Students	3	–	3	1	2	3
Totals	474	126	600	505	142	647
B. Stockbridge School						
Second year	65	8	73	102	4	106
First year	125	8	133	126	10	136
Totals	190	16	206	228	14	242
C. Short Course Enrollment						
Winter School	47	2	49	67	8	75
Summer School	53	96	149	51	114	165
Vocational Poultry Course	4	–	4	3	1	4
Totals	104	98	202	121	123	244

D. Educational Meetings

	1927	1928
Annual Extension Service Conference	115	125
New England Greenkeepers' Club	30	–
Polish Farmers' Day	250	225
4-H Canning and Garden Leaders' Conference	30	42
Massachusetts Park Association	35	–
Massachusetts Cemetery Association	68	–
Lawn Day	45	50
Lime Dealers' Conference	40	–
4-H Leaders' Canning School	57	15
Camp Gilbert (4-H Club Members and Local Leaders)	150	160
Farm and Home Week	3,800	3,500
Field Day, Market Garden Field Station	895	650
Extension Home Economics Conference	30	25
High School Day	900	1,000
English Folk Dance School	150	140
University Extension Industrial Institute	50	–
Middlesex County Club Champions	75	80
New England Association of Chemistry Teachers	50	–
Hampshire County League of Churches	150	–

	1927	1928
Connecticut Valley Section of American Chemical Society	70	75
Rural Ministers' School	15	–
Cosmopolitan Club of Connecticut Valley Colleges	40	–
International Students' Educational Group	30	35
Club Agents' Conference	–	22
Massachusetts Veterinarian Association	–	35
Conference Laboratory Workers in Bacillary White Diarrhea Control	–	12
New England Livestock Sanitary Officials	–	20
Poultry Breeders' Conference	–	125
Tobacco Research Workers	–	30
Tobacco Field Day	–	70
Northeastern States Extension Agronomists	–	25
Massachusetts Home Economics Association	–	200
Western Massachusetts Fruit Growers	–	90
Boston Gardeners' and Florists' Club	–	40
Northampton Florists' and Garden Club	–	25
New England Institute of Cooperation	–	150
Fall Horticultural Show	–	2,000
Spring Flower and Greenskeepers' Show	–	1,000
Extract Manufacturers' Ice Cream Conference	–	21
Springfield Garden Club	–	50
Connecticut Valley Student Missionary Association	–	36
Total	7,075	10,073

TABLE IV. — STATISTICS OF FRESHMEN ENTERING MASSACHUSETTS AGRICULTURAL COLLEGE, SEPTEMBER, 1928

A. *Home Addresses of Students (classified by Towns and Cities)*

Abington	3
Acton	1
Adams	1
Amherst	10
Arlington	4
Ashfield	2
Ashland	1
ATTLEBORO	1
Auburn	1
Barnstable	1
Barre	1
Belchertown	1
Belmont	2
BOSTON	8
Braintree	1
BROCKTON	1
Brookfield	1
Brookline	1
Burlington	1
CAIRO, Egypt	1
CAMBRIDGE	1
Charlemont	1
Chatham	3
CHELSEA	1
Chesterfield	1
CHICOPEE	1
Cummington	1
Dalton	2
Danvers	1
Dedham	1
Deerfield	2
Dracut	1
Dunstable	1
Easton	1
EVERETT	2
FALL RIVER	4
Franklin	2
Glen Rock, N. J.	1
GLOUCESTER	2
Gorham, Me.	1
Great Barrington	1
Greenfield	2
Greenwich	1
Groton	1
Hamilton	1
Hampden	1
HAVERHILL	1
Hawley	1
Hilversum, Holland	1
Holden	1
HOLYOKE	10
Hudson	2
Ipswich	1
LAWRENCE	1
Lebanon, N. H.	1
Lee	2
Leverett	1
Littleton	1
LOWELL	2
LYNN	2
Manchester	1
Marblehead	1
MARLBOROUGH	1
Medway	1
MELROSE	2
Merrimac	1
Methuen	1
Milford	1
Millbury	1
Millis	1
Monson	2
Montague	2
MORGANTOWN, W. Va.	1
Mount Ephraim, N. J.	1
Nantucket	1
Needham	1
NEW BEDFORD	1
NEWBURYPORT	1
NEWTON	3
Norfolk	1
NORTH ADAMS	2
NORTHAMPTON	4
North Andover	1
Northbridge	1
Northfield	1
NORWALK, Conn.	1
Orange	1
Permet, Albania	1
Peru, N. Y.	1
PHOENIX, Ariz.	1
Plainville	1
Plymouth	1
Portsmouth, R. I.	1
Pownal, Vt.	1
Provincetown	2
Putney, Vt.	1
Rockport	1
Rowley	1
Sheffield	2
Southampton	2
Southbridge	2
South Hadley	1
Southwick	1
SPRINGFIELD	13
STAMFORD, Conn.	1
Stockbridge	1
Stoneham	1
Sudbury	1
Sunderland	2
Swampscott	1
Tolland	1
Troy Hills, N. J.	1
Wakefield	2
Walpole	2
WALTHAM	7
Ware	1
Watertown	1
Wayland	1
Westborough	2
West Boylston	1
West Bridgewater	1
Westfield	1
Weymouth	3
WHITE PLAINS, N. Y.	1
Wilbraham	1
Williamsburg	4
Williamstown	1
Winthrop	1
WORCESTER	3

B. *Home Addresses (classified by States and Countries)*

	Number	Per Cent		Number	Per Cent
Albania	1	.46	New Jersey	3	1.37
Arizona	1	.46	New York	2	.91
Connecticut	2	.91	Rhode Island	1	.46
Egypt	1	.46	Vermont	2	.91
Holland	1	.46	West Virginia	1	.46
Maine	1	.46			
Massachusetts	201	92.20		218	99.98
New Hampshire	1	.46			

C. *Home Addresses (classified by Counties of Massachusetts)*

	Number	Per Cent		Number	Per Cent
Barnstable	6	2.98	Nantucket	1	.50
Berkshire	12	5.97	Norfolk	15	7.46
Bristol	7	3.48	Plymouth	6	2.98
Essex	18	8.96	Suffolk	10	4.98
Franklin	15	7.46	Worcester	15	7.46
Hampden	31	15.42			
Hampshire	26	12.93		201	99.98
Middlesex	39	19.40			

D. *Nativity of Parents*

	Number	Per Cent
Neither parent foreign born	148	67.89
Both parents foreign born	43	19.72
Father (only) foreign born	19	8.71
Mother (only) foreign born	8	3.67
	218	99.99

E. *Education of Father*

	Number	Per Cent
Common School	86	39.45
High School	64	29.35
Business School	20	9.17
College or University	38	17.43
No statistics	10	4.59
	218	99.99

F. *Occupation of Father*

	Number	Per Cent
Agriculture and Horticulture	43	19.72
Artisans	38	17.43
Business	52	23.85
Professional	13	5.96
Miscellaneous	52	23.85
Retired	4	1.83
Deceased	5	2.30
No statistics	11	5.05
	218	99.99

G. *Intended Vocation of Students*

	Men	Women	Total	Per Cent
1. *Farming*, including Market Gardening, Nursery business, Florist's business, Fruit Growing, Management of Estates, General Farming, Poultry Husbandry, Livestock Breeding, etc.	26	–	26	11.92
2. *Agricultural Business*, including sales of agricultural products and other capacities in such as the fertilizer industry, the feed industry, etc.	–	–	–	–
3. *Science*, including Chemistry, Botany, Entomology, Bacteriology, etc., in such capacities as research experts, laboratory assistants, technologists, etc.	44	9	53	24.31
4. Landscape Architects and Agricultural Engineers	17	1	18	8.25
5. *Teachers*, including College Professors, High School Instructors, Specialists in Extension Education, etc.	6	8	14	6.42
6. *Professional Practitioners*, including Physicians, Surgeons, Dentists, Lawyers, Veterinarians, Ministers, etc.	13	1	14	6.42
7. Civil Engineers	–	–	–	–
8. *Industrial Enterprises*, including Manufacturing, Merchandising, Advertising, Banking, Accounting, Real Estate, Insurance, etc.	1	–	1	.46
9. Authors, Artists, Journalists, etc.	–	2	2	.92
10. Home Economics	–	13	13	5.96
11. Miscellaneous	6	4	10	4.59
12. Undecided	57	10	67	30.73
	170	48	218	99.98

H. *Farm Experience*

	Men	Women	Total	Per Cent
Brought up on a farm	31	13	44	20.18
Not brought up on a farm and having no or practically no farm experience	122	33	155	71.10
Not brought up on a farm but having had some farm experience	17	2	19	8.70
	170	48	218	99.98

I. *Miscellaneous Statistics*

Average age (years)	18.47

MASSACHUSETTS AGRICULTURAL COLLEGE

SUMMER SCHOOL

JULY 1—AUGUST 10

1929

THE M. A. C. BULLETIN

Amherst, Mass.

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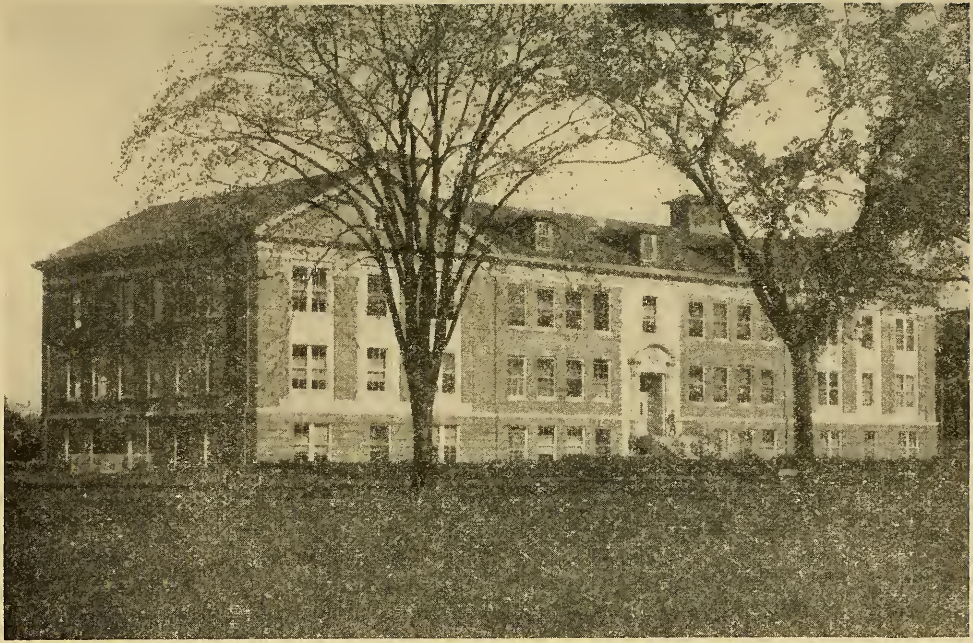


GOESSMANN CHEMISTRY LABORATORY

FACULTY

Roscoe W. Thatcher, D.Agr., LL.D., *President of the College.*
Roland H. Verbeck, B.S., *Director of Short Courses.*
Robert D. Hawley, B.S., *Secretary of the College.*
Fred C. Kenney, *Treasurer of the College.*
Basil B. Wood, A.B., *Librarian.*
Mrs. Maud Marshall, *Matron of Women's Dormitory.*
Joseph S. Butts, M.S., *Instructor in Chemistry.*
Hester Chadderdon, A.M., *Instructor in Home Economics Education at University of Minnesota.*
Henry T. Fernald, Ph.D., *Professor of Entomology, Head of Department, Director of the Graduate School.*
Harry N. Glick, Ph.D., *Professor of Agricultural Education.*
Clarence E. Gordon, Ph.D., *Professor of Zoology and Geology, Head of Department, Head of Division of Science.*
Franklin E. Heald, A.M., *Agent for Agricultural Teacher-Training in State Department of Education.*
Alma H. Jones, M.S., *Child Specialist and Associate Professor in Extension Service at Iowa State College.*
William L. Machmer, A.M., *Dean of the College and Professor of Mathematics.*
W. L. Matthews, A.M., *Superintendent of Schools, Franklin, Ky.*
A. Vincent Osmun, M.S., *Professor of Botany and Head of Department.*
Ransom C. Packard, B.S.A., *Instructor in Bacteriology.*
Charles H. Patterson, A.M., *Professor of English, Head of Department of Languages and Literature.*
Walter E. Prince, A.M., *Associate Professor of English.*
Lucile W. Reynolds, A.M., *Candidate for Ph.D. at University of Chicago.*
Clark L. Thayer, B.S., *Professor of Floriculture, Head of Department.*
Charles H. Thompson, M.S., *Professor of Horticulture.*
Marion L. Tucker, A.M., *Assistant Professor of Home Economics.*
Winthrop S. Welles, B.S., *Professor of Education, Head of Department.*

FACULTY COMMITTEES

Committee on Admission.

Dean William L. Machmer.
Director Roland H. Verbeck.
Dr. Henry T. Fernald.

Committee on Course of Study.

Dean William L. Machmer.
Director Roland H. Verbeck.
Dr. Henry T. Fernald.
Professor Frank A. Waugh.
Professor Winthrop S. Welles.

GENERAL ANNOUNCEMENT

The twenty-second session of the summer school at the Massachusetts Agricultural College will begin July 1 and continue until August 10 inclusive. Only graduate and undergraduate work will be offered.

Admission.—There are no formal examinations for admission to the summer session. Students, both men and women, will be admitted to such courses as their preparation allows.

Purposes.—The summer school program is arranged for:

1. School superintendents and teachers connected with senior and junior high schools, normal schools, colleges and universities who seek advanced instruction either with or without relation to an academic degree.
2. College students who desire to further their regular college work.
3. Teachers who desire to pursue courses that will better prepare them for their work.
4. Any serious student who finds courses suited to his preparation and needs.

Registration.—Registration will be held in the Memorial Hall from 9 A.M. to 5 P.M. on Monday, July 1. Late registrations should be made at the Short Course Office, South College. (Telephone Amherst 900.)

Classes will begin promptly at 8 A.M. Tuesday, July 2, and will be held as announced in the description of courses until Wednesday, August 7, inclusive. Examinations will be held on Thursday and Friday, August 8 and 9.

Classes will be held on Saturdays to make up days missed due to registration and July 4th, the holiday, according to the following calendar:

Saturday, July 6—Monday classes.
" July 13—Thursday classes

For Home Economics students registering on Friday July 5, the above Saturday schedule and:

Saturday, July 20th—Tuesday classes.
" July 27th—Wednesday classes.
" August 3—Friday classes.

Registration of Graduate Students.—(Summer Session.) Graduate students not candidates for an advanced degree at the Massachusetts Agricultural College must submit evidence of their graduation but are not required to file transcripts of their past training. All such should consult the Director of the Graduate School and secure his consent before registering for any courses. Such students may obtain, upon request to the Director, an official statement of the work completed in the Summer Session.

Graduate students desiring credit toward an advanced degree at the Massachusetts Agricultural College must meet the requirements of the Graduate School at the time of their registration, as follows:

Admission.—Admission to the Graduate School will be granted:

1. To graduates of the Massachusetts Agricultural College.
2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of accepted standing, but has not taken as much of the subject as he desires to select for his major study, as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work in that department as the head of the department may consider necessary, without credit toward his advanced degree.

Admission to the Graduate School does not necessarily admit to candidacy for an advanced degree, students holding a bachelor's degree being in some cases permitted to take graduate work without becoming candidates for higher degrees.

Applications for membership in the Graduate School should be presented to the Director of the School, accompanied by an official transcript of the applicant's undergraduate, and any graduate work he may have had, and by a statement whether the applicant desired to work for a degree.

Registration is required of all students taking graduate courses, the registration card being obtained through the Director of the Graduate School.

Fees.—There are no tuition or laboratory fees for students registered in the Graduate School as candidates for advanced degrees at the Massachusetts Agricultural College. For other graduate students the usual Summer School expenses of tuition, special fees and auditor's fee will be collected.

Graduate Studies.—Some graduate work is available during every term of the year; in the summer quarter, however, special arrangements must be made with the head of the department in which the student plans to take work, except in the case of courses offered in this circular.

Change of Program.—Notice of any proposed addition or cancellation of courses after registration must be reported at once in person at the office of the Director of the Summer Session. Students will be allowed after securing the consent of the Director to make such additions or cancellations up to and including July 9. After July 9 they will be permitted to make no changes whatever. A student attending any course is required to do the full work assigned to the class.

Credits.—All courses are measured in terms of credit units. A credit is earned by carrying a course that meets two hours a week throughout a term of six weeks. As a rule two hours of laboratory work are considered the equivalent of one hour of lecture or recitation. The total amount of collegiate credit which may be earned cannot exceed 10 term credits.

A number preceding the name of the course indicates the course is offered in the regular college program and corresponds exactly in hours, credits, and content.

Where number comes after the course designation, there is a difference in material presented but full credits are accepted.

When no number occurs either before or after the course, there is no similar or equivalent course offering in the college catalogue. Such courses are usually designed for special professional improvement for teachers and carry full summer session credits.

Recreation.—The Summer Session offers many advantages. Amherst is a quiet college town located in the beautiful Connecticut Valley. The living conditions are excellent and especially desirable for students who wish to spend a part of the summer in study in restful surroundings.

The social life of the Summer School is attractive. There are many interesting places—groves, brooks, woods, picnic grounds near Amherst which are easily accessible, especially for those with cars.

The Annual Farm and Home Week held under the direction of the College Extension Service in July brings hundreds of people to the campus for the four-day program. This year the dates are July 23 to July 26, inclusive. A fine program of lectures, with many speakers of national prominence, gives summer school students an unusual opportunity during this session. No extra fees. Plan to have your friends visit the college at that time.

Golf.—Amherst has a fine nine-hole course and privileges are extended to summer school students at a special rate for the six weeks.

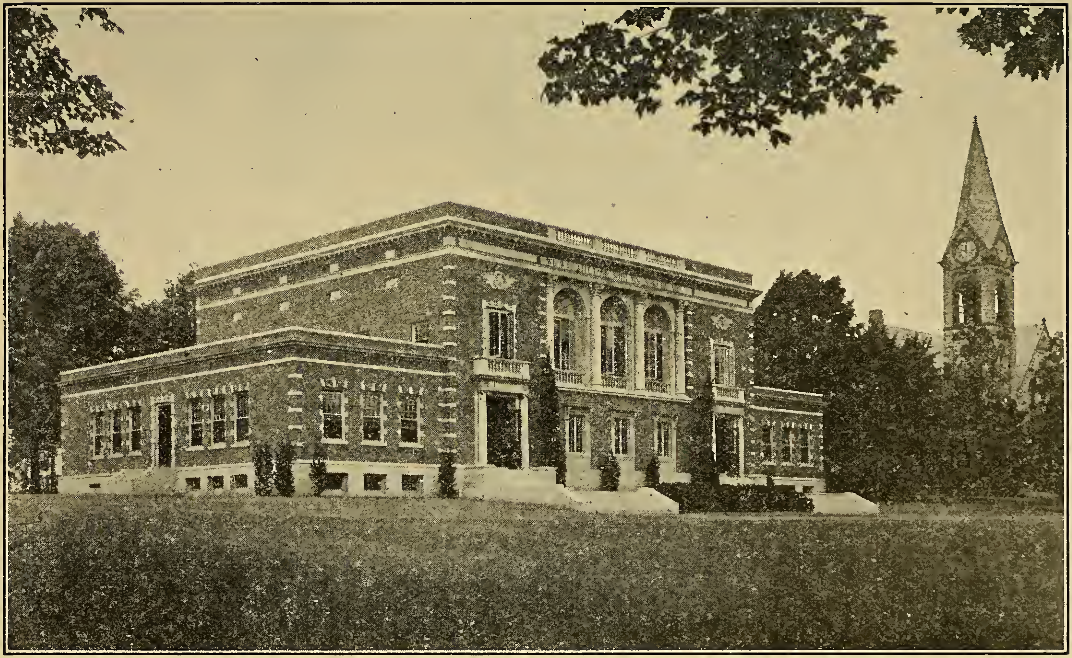
Riding.—The College has excellent facilities for horseback riding. Saddle horses are available through the courtesy of the Military Department and instruction is given by United States Army officers.

Tennis.—There are many fine tennis courts available for summer school students.

Informals.—At regular intervals through the session informal social gatherings for bridge, bowling, and dancing will be held in the Memorial Building.

A reception to all summer school students will be held in the Memorial Building Saturday evening, July 6. Secure tickets at Short Course Office for all summer school social affairs at time of registration. Admission limited to ticket-holders.

Expenses.—There is a tuition charge of $10 to residents of Massachusetts. Those students not residents of Massachusetts must pay a tuition fee of $30 for the summer session. Special fees; recreation $2.00 (for all students); aud-



MEMORIAL BUILDING.

Erected in memory of the men of the College who died in the Great War.
The center of summer school indoor recreation activities:—
bowling, bridge, dancing.

itor's fee, $2.00, for those who may wish to visit one class without taking the prescribed work.

The total estimated expense for the summer session need not exceed one hundred dollars ($100.00) itemized as follows: Board for six weeks $45.00; room rent six weeks, $18.00; books, $5.00; laboratory fees, $5.00; tuition, $10.00; laundry, $6.00; incidentals, $10.00.

Rooms (Women).—The women's dormitory is available for women students. There are thirty double and thirty-eight single rooms. A uniform rate of $3.00 per week will be charged each student. *Each one will be required to supply her own blankets, sheets, pillow cases, etc.* Convenient arrangements for laundry work may be made in Amherst. *Students taking rooms in the dormitory must conform to dormitory regulations.* Observance of these regulations is one of the conditions under which the rooms are rented and failure to comply with the regulations will mean a surrender of the room and a forfeiture of the amount paid. A student whose conduct is not satisfactory may be asked to withdraw from the dormitory.

All requests for dormitory rooms must be made to the Treasurer of the college. A deposit of $3 is required in order to secure a reservation in the dormitory. Students will be notified by the Treasurer, upon receipt of the fees, as to the location of the room. In case any change is desired, the request should be made immediately. Deposits will not be refunded after the beginning of the summer session. The deposit is applied to total payment for the room at registration.

Rooms (Men.)—Comfortable rooms can be secured at moderate prices in private homes as follows:

Single room $3.00-$4.00 per week; double rooms or suites for two persons $2.50-$3.00 per person; board $7.00 per week and up. A list of rooms available in the village will be furnished to summer school students at the time of registration.

Board.—The college maintains a cafeteria on the self-service plan in Draper Hall, on the college grounds. Board may be had at from $6.00 to $8.00 per week. Good boarding places can also be secured outside of the college if desired.

Laboratory Fees:

Clothing	$1.00
Foods	4.00
Cryptogamic Botany	2.00
55. Garden Flowers and Bedding Plants	1.50
80. Physiological Chemistry	4.00

Rules and Regulations.—As a guide to those who come to the College for the first time, the following extracts are taken from the regular rules of the College:

The customary high standard of college men and women in honor, manliness, self-respect, and consideration for the rights of others constitutes the standard of student deportment.

It should be understood that the College acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend but also to name conditions under which students may remain in the institution.

It is the custom of the College that all socials should first have the approval of some recognized College authority.

The College.—The College campus occupies an attractive site three-quarters of a mile north of Amherst center. It is connected with the town and the railway station by electric car service. The College has over 700 acres of land, most of which is in a high state of cultivation, and illustrates most of the leading agricultural industries of Massachusetts. There is a large range of greenhouses of the most modern and approved type; there is a modern dairy barn with a large herd of pure-bred cattle; there are good horses, pure-bred swine, sheep, and poultry; there are fields of corn, potatoes, clover, and grass in season; orchards of apple, peach, plum, and pear trees; tracts of good forest land, nurseries, and market gardens. There are also considerable tracts devoted to experiments, many of which are of unusual interest. Then there are well-equipped departments of botany, entomology, and chemistry, dealing in the most thorough manner with these special sciences. The advantages of the plant, equipment, and teaching staff are made available to Summer School students.

Libraries.—The College Library occupies the entire building formerly partly occupied by the chapel. It contains more than 73,000 bound volumes and a very large collection of pamphlets, probably twice as numerous, which are of great practical value, being monographs on the technical subjects studied in the College. These pamphlets include particularly the publications of the United States Department of Agriculture and those of the State Experiment Stations of other Agricultural colleges in this country and abroad. Among the bound volumes, works on agriculture, horticulture, botany, entomology and the various sciences, connected especially with agriculture predominate, but literature, history, economics, religion, sociology and art are also well represented. More than six hundred periodicals covering technical and general subjects, and including the best farm papers are regularly taken and both the current numbers and the back files are readily accessible.

The Library is open for readers from 8 A.M. to 10 P.M. during term time and during part of Sunday. Vacation hours are somewhat shorter.

The excellent facilities of the Converse Memorial Library of Amherst College are courteously extended to members of the Massachusetts Agricultural College Summer School. Hours 9.00 to 12.00 A.M. during the summer.

The town of Amherst in its Jones Memorial Library offers further additional advantages of unusual excellence.

Volumes in all three libraries number nearly 235,000.

Railroad Connections.—Boston and Maine Railroad trains run direct to Amherst from Boston. Connections also may be made, Boston to Greenfield, with bus service to Amherst.

The Boston and Albany Railroad affords a quicker route, changing at Palmer for the Central Vermont Railroad stopping at Amherst, or going through to Springfield for transfer. Here change to Boston and Maine for Northampton, and take trolley there to Amherst. Or trolley may be taken directly from Springfield for Holyoke, changing to Amherst trolley at Holyoke. A very picturesque ride up the valley, passing Mt. Holyoke College at South Hadley.

SUMMER SCHOOL COURSES

EDUCATION

The courses indicated here are intended primarily for those who are engaged in teaching or who are preparing to teach. Some of them are of value as general courses for those not having this particular objective. Our experience indicates that these opportunities are especially appreciated by students who are pursuing work toward both undergraduate and graduate degrees. Through the co-operation of the State Department of Education the College is able to offer special advantages in training in the field of secondary school teaching and vocational teaching. In this co-operation R. O. Small, Director of Vocational Education; F. W. Morse, Supervisor of Secondary Education; R. W. Stimson, Supervisor of Agricultural Education, and possibly others will participate.

Education courses numbered 52, 56, 75, 79, and 95, if carried with additional work involving a thesis, may be taken for graduate credit, provided prerequisites in Education have been satisfied, and the work is rated at 80 or above. Those numbered in the hundreds are special and accepted for graduate credit.

51. Principles and Methods of Teaching.—The course consists of a study of general principles of teaching and school management applied to particular "cases" taken from actual experience in public school work. Discussions of rational solutions of these "cases" tend to fix the ideas in method. Certain assigned and optional readings are required. These are both technical and inspirational in character and cover the best there is printed on the subject of methods of teaching. They are supported by sharp class discussions of the main issues. Exercises in teaching under supervision are also required with criticism and discussion of methods and results. A basic text is used. 10 class hours. Credit 5. *Professor Welles.* 10:00-11:50 M.T.W.T.F., Room 102, Stockbridge Hall.

52. History of the Philosophy and Practice in Education.—(Offered in Summer School of 1930.) A study of the development of philosophical ideas and movements and their relation to educational theory and practice. The relation between the fundamental aspects of the history of education and the significant factors in the history of civilization is stressed. 10 class hours. Credit 5.

55. Introduction to Psychology.—A study of the fundamental principles of psychology both from the standpoint of method and content. Constant attempts are made to explain human behavior both mental and physical in the light of the principles studied. It is a basic course for those anticipating further study in psychology as well as a practical cultural course for those who can take but one course in this field. 10 class hours. Credit 5. *Professor Glick.* 8:00-9:50, M.T.W.T.F., Room 102, Stockbridge Hall.

56. Educational Psychology.—An application of the principles of psychology to the problems of education. Emphasis is placed upon (1) Original nature—its cause and meaning for education; (2) Individual differences—their nature, cause, measurement and significance; (3) Learning—its nature, kinds, most economical methods, etc.; (4) Transfer of training—its amount and significance; (5) Measurement of achievement—educational tests, new type examinations, distribution of marks. 10 class hours. Credit 5. *Professor Matthews.* 8:00-9:50 M.T.W.T.F., Room 110, Stockbridge Hall.

75. Secondary Education.—This course has two main objectives: (1) to aid high school teachers and principals in gaining a valuable perspective of the aims and functions of secondary education and to give them a near view of the details by which these are realized. (2) To present administrative phases of secondary education that are involved in curricula, schedules, extra curricular activities, relations with other organized forms of education, etc. Inglis' "Principles of Secondary Education" or its equivalent is used as a text. 6 class hours. Credit 3. *Professor Matthews.* 3:00-4:50 M.W.Th., Room 111, Stockbridge Hall.

76. Special Methods in Teaching Vocational Agriculture.—The work consists of outlining lessons and projects for the teaching of agriculture or related subjects in agricultural schools or departments; the application of principles of vocational education as embodied in the Smith-Hughes Act and state legislation relative to agricultural education; the necessary adjustments relating to the school, community and administrative officials. (Students electing this course should not elect Course 103.) Undergraduates must secure the consent of Professor Welles before enrolling. 10 class hours. Credit 5. *Mr. Heald.** 8:00-9.50 M.T.W.T.F., Room 317, Stockbridge Hall.

79. Tests and Measurements.—A critical study is made of the development, theory, use, application, etc., of the various types of mental tests and measurements with emphasis upon their function in the schools. Practice is given in the administration and scoring of tests. Modern statistical methods are applied to the interpretation of results. 4 class hours. 2 laboratory hours. Credit 3. *Professor Glick.* 1:00-2:50 M.W.Th., Room 102, Stockbridge Hall.

93. Experimental Psychology.—(Offered in Summer School of 1930.) Demonstrations are made of the apparatus and methods of experimental psychology. Experiments are performed by members of the class. Statistical treatment is applied to the experimental data. The objective of the course is to develop scientific observation of human behavior. 6 class hours. Credit 3.

95. Modern Trend in Educational Philosophy.—A general survey of present philosophical theories and tendencies with special emphasis upon their significance in determining present educational objectives and practices. Special attention is given to a social philosophy of education. 6 class hours. Credit 3. *Professor Welles.* 3:00-4:50 M.W.Th., Room 102, Stockbridge Hall.

103. The Employed Teacher of Agriculture.—For employed teachers and directors of vocational agriculture. Prospective candidates may be admitted by special arrangement. The course deals with problems which grow out of the experiences of Massachusetts teachers of vocational agriculture; methods and technique of teaching agriculture. Constructive assignments bearing upon the individual experiences and prospects of the members of the class are merged with the campaigns under way for better teaching in agricultural schools. No student should elect both Special Methods (Course 76) and this course during the same term.

It is desirable that, by previous correspondence, a plan may be developed with reference to individual problems and the instructor will recommend some definite data relating to the problem to be secured before the summer school opens. 10 class hours. Credit 5. *Mr. Heald.** 8:00-9:50 M.T.W.T.F., Room 317, Stockbridge Hall.

104. Vocational Education.—A study of the laws, rulings and policies in Federal and State supported vocational education in the United States. The philosophy and experiences leading to the legislation and the evolution of a well defined body of practice especially in Massachusetts since 1906. The types of work involved, the occupations represented, the administration and supervisory problems, standards set, approval factors, machinery necessary and dangers to be avoided. Day schools, part-time and continuation schools, evening schools. Relation to other secondary education. While leaning toward the agricultural field this course avoids the specific phase treated in the "Methods" courses. Mr. R. O. Small, Director of Vocational Education, and Mr. R. W. Stimson, Supervisor of Agricultural Education, each give one week of service in this course. Brief correspondence in advance addressed to the instructor in charge will enable the student to secure maximum values from the course. 6 class hours. Credit 3. *Mr. Heald.** 10:00-10:50 M.W., 10:00-11:50 Tu.Th., Room 317, Stockbridge Hall.

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* Supervisor of Teacher Training for Agricultural Schools representing the State Department of Education.

HOME ECONOMICS

The courses in home economics to be offered in the summer session are planned primarily to meet the needs of teachers of home economics. As the annual meeting of the American Home Economics Association which is to be held in Boston July 1-5 is bringing a rare opportunity for professional improvement, it is taken for granted that home economics teachers will wish to attend these meetings as well as to enroll in the summer session. Hence, a special arrangement has been made whereby registration in home economics classes will be deferred until July 5. All of the classes will be in session on Saturday July 6 to make up for the 4th. Home economics classes will be in session for three successive Saturdays to make up for class work missed on July 2, 3, and 5. This should be a very satisfactory arrangement for everyone concerned, for it will insure an opportunity to attend the home economics meeting and will, at the same time, lessen the period of summer school residence, which will cut down somewhat on expenses. Although these courses have been planned to meet some of the special needs of home economics teachers in Massachusetts, they will be of value to teachers and extension workers from any section of the country.

Child Care and Training.—This is a study of the physical and mental growth and development of the child, the rational care of children at various ages, the treatment of behavior problems, and the influence of environment in shaping personality. 5 class hours and 1 laboratory period per week. Credit 3. *Mrs. Jones.* 10:00-10:50 M.T.W.T.F., 1:00-3:50 F.

Home Management Problems.—This course is concerned with the determination and study of the management factors of the modern home, particularly as they relate to the food, clothing and equipment problems; the problems that arise in planning family expenditures, in marketing, in child care and development; in promoting wholesome relationships in the family, and in the wise use of leisure. Brief consideration will be given to the new course of study in home management for junior and senior high schools which has recently been prepared by the state curriculum revision committee. 5 class hours and 1 laboratory period per week. Credit 3. *Miss Reynolds.* 8:00-8:50 M.T.W.T.F., 1:00-3:50 W.

Special Methods in Teaching Home Economics.—This course will discuss educational objectives as applied to the teaching of home economics in the junior and senior high schools, the psychological basis for teaching, the evaluation of instructional material, the principles of curriculum construction, modes of teaching, and space and equipment. Of especial value for those who wish to keep abreast of the times and to know about the recent trends in home economics. 5 class hours and 1 laboratory period per week. Credit 3. *Miss Chadderdon.* 11:00-11:50 M.T.W.T.F., 1:00-3:50 M.

Clothing Selection, Unit I.—This course is planned to give an up-to-date review of subject matter, and available information on design, color and line applied to clothing. It will also consider clothing selection from the standpoint of economics and will include such topics as new textile information, suggestions for buying, budgeting, and text books. 15 class hours and 6 three-hour laboratory periods, extending from July 5 to 23. Credit 2. *Miss Tucker.* 9:00-9:50 M.T. W.T.F., 1:00-2:50 Tu.Thu., Room 212 Stockbridge Hall.

Clothing Construction and Care, Unit 2.—The home economics worker in clothing who wishes to bring her knowledge of clothing construction up-to-date, will find this unit helpful. It will include a brief study of patterns, fitting, garment finishes and decoration, and also a study of available helps in teaching. Suggestions on the care and hygiene of clothing will form a part of the course. One garment, selected according to the needs and ability of each student will be made. 15 class hours and 6 three-hour laboratory periods, extending from July 24 to August 10. Credit 2. *Miss Tucker.* 9:00-9:50 M.T.W.T.F., 1:00-2:50 Tu.Thu., Room 212, Stockbridge Hall.

SCIENCE AND ALLIED COURSES

52. Advanced Entomology.— Studies on how to recognize and classify insects in the various groups. The work will be so largely individual that any special needs or wishes of the student can be met, or may be general for those who so desire. 4 two-hour laboratory periods per week. Credit 2. *Professor Fernald.* 10:00-11:50 M.Tu.Thu.F., Room H, Fernald Hall.

60. Public Health.—This course will treat the following subjects: the human body in health and disease; individual, family and social elements; agencies of disease—nutrition, and food including milk, food poisoning and infection, air and ventilation, water and water supplies, sewage and sewage disposal, avenues of infection, susceptibility and resistance; communicable diseases, isolation and disinfection; public control; health laws and organization.

This course is designed to present the modern public health movement as it applies to organized effort to prevent disease and improve community welfare. 5 class hours. Credit 3. *Mr. Packard.* 8:00-8:50 M.T.W.T.F., Room 28, Bacteriology Building.

Fresh Water Algæ, Fungi, Liverworts, Mosses and Ferns.—(Equivalent to Botany 26.) Types of spore plants or Cryptogams are studied in this course, especial attention being given to their morphology, life-histories and environmental habits. These plants compose one of the most interesting and important groups of the Plant Kingdom. They are not so generally familiar as the flowering plants, however, and because of this it is believed that teachers of botany and biology, as well as others, may wish to embrace the opportunity offered by this course to study them. The region in and about Amherst is unusually rich in cryptogamic flora, especially the ferns, and hence the conditions for field study and collecting are ideal. Clark Hall, wholly devoted to the work of the Department of Botany, provides unexcelled laboratory facilities. 2 lectures and 4 two-hour laboratory periods per week. Credit 4. *Professor Osmun.* 9:00-9:50 Tu. Th., Room A, Clark Hall. 10:00-11:50 M.T.W.T., Room C, Clark Hall.

80.—Physiological and Food Chemistry. Open to those who have had elementary chemistry. Designed to acquaint the student with the chemistry of the physiological processes in plants and animals. The study of food, its digestion and utilization by the human body is the principal subject. The physiology and functions of the principal organs of the body, the effects of abnormal functioning and recent advances in correcting the same, are discussed. In the laboratory experiments are conducted with food materials and with the processes and products of digestion, secretion and excretion.

The course, while of general interest, should appeal especially to those in home economics, dietetics, chemistry, public health, botany and animal husbandry. 5 lecture hours and 2 four-hour laboratory periods per week. Credit 5. *Mr. Butts.* 8:00-8:50 M.T.W.T.F., Room 28, Goessmann Laboratory. 1:00-4.50 M.W., Room 107, Goessmann Laboratory.

Plant Materials.—(Equivalent to Horticulture 52.) Especially hardy trees and shrubs used in general landscape planting; their identification, propagation, culture and use in landscape gardening. The collection on the college grounds offers excellent opportunity for such summer study. 6 lecture hours per week. Credit 3. *Professor Thompson.* 8:00-8:50 M.F., 2:00-3:50 Tu.Thu., Room F, French Hall.

55. Garden Flowers and Bedding Plants.—Will cover the general field of outdoor floriculture, especially as practiced in connection with floriculture and landscape gardening. The propagation, culture, and uses of perennials, annuals, and bedding plants will be studied with ample work in the college garden. 5 lecture hours and 1 afternoon per week. Credit 3. *Professor Thayer.* 9:00-9:50 M.T.W. T.F., Room C, French Hall. 2:00-3:50 M., Room B, French Hall.

The Connecticut Valley at the latitude of Amherst; view looking west. Part of the campus of the Massachusetts Agricultural College in the foreground. The skyline in the distance represents an uplifted ancient erosion surface, or peneplain. During and after uplift of the region running water and the agents of the weather produced a wide-open valley along a belt of yielding rocks. In late glacial times a lake occupied the region and clays and silts laid down in this lake now form the flat and fertile fields dotted with tobacco barns. The picture is taken from the western slope of a drumloid hill of material laid down by the advancing ice-sheet.

Geologic Processes and the History of Land Forms.—(Equivalent to Geology 50.) The exercises will deal largely with the work of various agents in shaping the surface features of the lands. Lectures, practical exercises, field excursions and outside reading will be employed in such sequence as will best serve the purpose of the course. The student will have access to mineral and rock collections, topographic and geologic maps, and numerous publications. The Connecticut Valley offers many advantages for an introduction to the principles of dynamic geology. Scheduled class hours are supplemented by outside assignments to meet the required credits. 3 one-hour periods and 2 two-hours periods per week. Credit 5. *Professor Gordon.* 9:00-11:50 M.W., 11:00-11:50 Tu. (This course may be withdrawn at the option of the instructor, prior to June 15.)

1. **Higher Algebra.**— This course will cover the usual topics included in an Advanced Algebra course and will be accepted as satisfying the first term course in Freshman Mathematics at this college. Especial stress will be laid on method of presentation and the course should therefore be useful to teachers of Mathematics in High Schools and Junior High Schools. Topics included: radicals, quadratic equations, the progressions, variation, binominal theorem, undetermined co-efficients, permutations and combinations, logarithms, determinants, theory of equations and series. Special opportunity will be given to teachers of mathematics to observe methods of presentation. 5 class hours per week. Credit 3. *Professor Machmer.* 9:00-9:50 M.T.W.T.F., Room B, Mathematics Building.

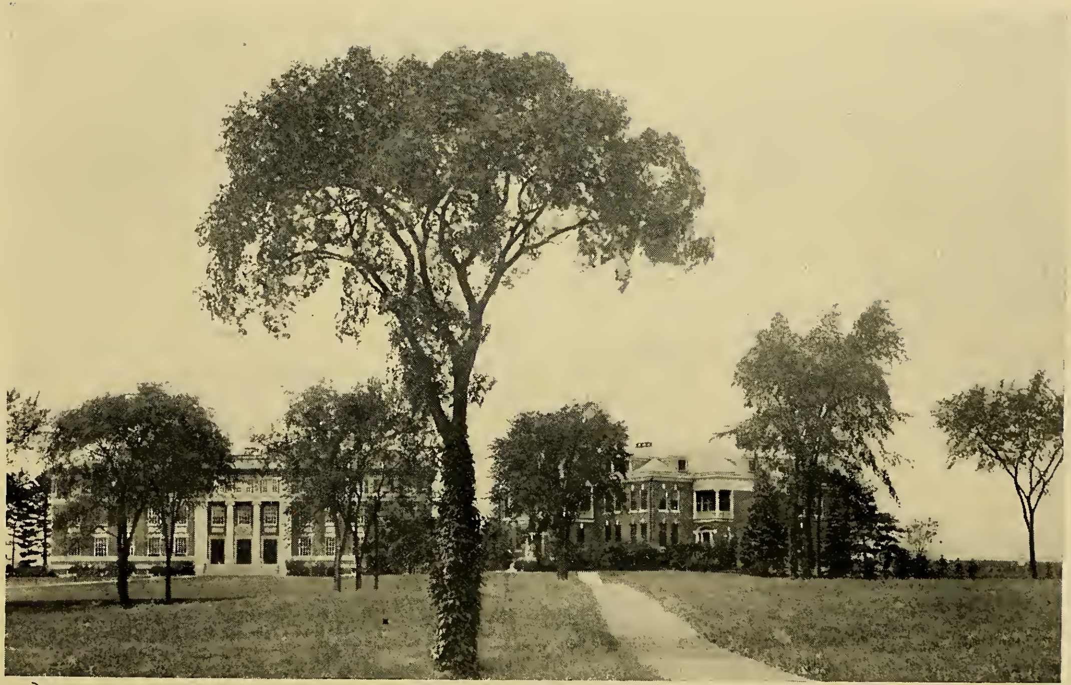
55. **American Literature.**—In this course an attempt will be made to show how American life and the changing character of American institutions and ideals are mirrored in the works of its most significant writers. The student may become acquainted with the men themselves, may investigate the forces that shaped them and made their contribution what it is. He will come to understand specific works and appreciate them. The writers considered will be Irving, Cooper, Hawthorne, Poe, Emerson, Lowell, Whitman, Howells, Clemens. The work can be adapted considerably to fit the needs of the group that may elect the course. 5 class hours. Credit 3. *Professor Prince.* 9:00-9:50 M.T.W.T.F., Room 111, Stockbridge Hall.

Ibsen and the Contemporary Drama.—A study of the whole movement of contemporary drama, beginning with its chief forerunner and most significant single figure—Henrik Ibsen; the Ibsen influence as found in the work of his successors in England and America, especially in technique and in the so-called "drama of ideas." Consideration of recent tendencies that depart from Ibsen principles. Reading and discussion of plays, particularly those of Ibsen, Wilde, Pinero, Jones, Fitch, Shaw, Galsworthy, O'Neill. 5 periods per week. Credit 3. *Professor Prince.* 10:00-10:50 M.T.W.T.F., Room 111, Stockbridge Hall.

Dramatic Presentation.—(Credits accepted as a substitute English course by arrangement.) Professor Patterson's course in Dramatic Presentation has been given to large classes since the beginning of the Summer School. Professor Patterson is a pupil of M. T. Brown, S. S. Curry, Otis Skinner, George Riddle, and others. He made a special study of the stage at the Comedie Francaise, Paris, where he was a pupil of Georges Berr. For some years he was on the professional stage with the Boston Museum Company, Maude Banks, Margaret Mather, and Otis Skinner. Mr. Patterson is known as a reader especially of Shakespeare's plays and Rip Van Winkle. He has given courses at West Virginia University, Boston School of Expression, and elsewhere.

The cultural value of dramatics to the individual and to the rural community is very great. Amateur plays are too often conceived as mere shows or social relaxation, and are produced in absolute ignorance of stage values, effective stage directions, proper play selection, character casting, and interpretation. Play production can be made both an art and a school for the rural community.

The course is practical. The members of the class are rehearsed in several plays. A few of the best plays are presented before the school. These presentations have attracted large audiences every year. The needs of teachers who produce plays in our schools are specially considered. 2 lectures and 4 two-hour practice periods a week. Credit 3. *Professor Patterson.* 3:00-4:50 M.T.W.T.F., Auditorium, Stockbridge Hall.



Stockbridge Hall and Dining Hall

THE M. A. C. BULLETIN
Amherst, Massachusetts

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CALENDAR, 1929-1930
The Stockbridge School of Agriculture

1929	
September 30, Monday	Freshman Registration
October 1, Tuesday	Senior Registration
October 2, Wednesday, 8 A. M.	Fall term begins for seniors
October 12, Saturday	Holiday, Columbus Day
November 11, Monday	Holiday, Armistice Day
November 27-December 2, Wednesday 12 M.—Monday, 8 A. M.	Thanksgiving Recess
December 21, Saturday, 12 M.	Fall term ends
1930	
January 2, Thursday, 7:30 A. M.	Winter term begins
February 22, Saturday	Holiday, Washington's Birthday
March 22, Saturday, 12 M.	Winter term ends
March 31, Monday 8 A. M.	Spring term begins
April 19, Saturday	Holiday, Patriots' Day
May 30, Friday	Holiday, Memorial Day
June 6-9, Friday-Monday	Commencement
October 6, Monday	Freshman Registration
October 7, Tuesday	Senior Registration
October 8, Wednesday, 8 A. M.	Fall term begins for seniors
October 13, Monday	Holiday, Observance of Columbus Day
November 11, Tuesday	Holiday, Armistice Day
November 26 December 1, Wednesday, 12 M.—Monday, 8:00 A. M.	Thanksgiving Recess
December 20, Saturday, 6 P. M.	Fall term ends
1931	
January 4, Monday 8:00 A. M.	Winter term begins

STAFF
Officers of General College Administration

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President of the College

WILLIAM L. MACHMER, A.M.
Dean of the College

FRED C. KENNEY
Treasurer of the College

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Secretary of the College

BASIL B. WOOD, A.B.
Librarian of the College

ROLAND H. VERBECK, B.S.
Director of Short Courses

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Supervisor of Placement Training

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George F. Pushee .... North Amherst
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Professor of Home Economics, Head of Department and Advisor of Women

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Charles H. Thayer .... South East Street
Instructor in Agronomy

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Professory of Pomology

John H. Vondell .... Fearing Street
Foreman of Poultry Plant and Instructor in Poultry Husbandry

Instructor in Vegetable Gardening

THE STOCKBRIDGE SCHOOL OF AGRICULTURE

A Two-Year Course in Practical Agriculture

The Stockbridge School of Agriculture was organized in 1918 to meet the demand for a short course in agriculture that might be taken by students who either did not possess college entrance requirements, or who, for one reason or another, were unable to take the four-year college course.

In May 1928, by vote of the trustees of the College, the name was changed from "The Two-Year Course in Practical Agriculture" to "The Stockbridge School of Agriculture". This change, it is expected, will more clearly emphasize the distinction between the degree courses and the non-degree courses offered by the College, and will correct the impression that students completing this course have completed two years of the college course. Graduates of The Stockbridge School of Agriculture are not eligible for entrance in the College and their school credits are not accepted as college credits.

Since its organization, at the request of the Massachusetts Legislature, the Two-Year Course in Practical Agriculture has registered over 1,000 students. There are now over 500 graduates of the course. Practically all of these are in Massachusetts or in New England, but graduates of the course are to be found in Florida, California, and many other states of the Union. More than 200 students registered in the School during the past year.

The growth of the course and the demand for more specific vocational training made necessary a reorganization of the work in 1921. As now arranged the student may specialize in one of seven vocations,—animal husbandry, dairy manufactures, floriculture, horticulture, pomology, poultry and vegetable gardening. This specialization does not prevent his securing a general working knowledge of other subjects.

The Stockbridge School will appeal not only to young men and women, but also to men and women of mature years and practical experience who wish to know more about the business of farming or associated agricultural industries.

AGRICULTURAL PLACEMENT

The work of placing students for apprentice training is in charge of the supervisor of placement training. (1) positions are secured that will enable a student to gain practical experience in his particular vocation; (2) a student desiring placement on his home farm may arrange for such assignment if the supervisor approves. As a rule, it will be found better for a student to spend this six months away from the home farm, even though he plans to be employed on the home farm after finishing the course. This statement is based on the experience of students who have already taken the course.

If credit is to be secured for the six months' placement training the following conditions must be carefully observed: (1) the student must interview the supervisor early in his first year in order that his qualifications, the type of farming he wishes to pursue, and his general fitness may be determined; (2) no arrangement for placement training may be made by the student himself until the supervisor has been consulted; (3) students are required to complete their period of training without unnecessary absences; (4) no transfers are to be made by a student, if he is to receive credit, until permission has been had from the supervisor; (5) a position may not be given up by the student until the supervisor has been notified; (6) a monthly report must be furnished on the form supplied, and submitted not later than the fifth of each month during his training period; (7) a student whose grade of work is regularly poor (below a 70 rating) in the classes of his major subject will not be eligible for placement training, unless recommended by the department in charge of his major work; (8) when a student fails to complete the requirements of his placement training with a satisfactory grade, he is not allowed to take the work of the second year; (9) all male students are given a thorough physical examination by the Department of Physical Education at the beginning of the college term. Any disabilities liable to affect the student's placement work are noted, and, if of a serious nature, recommendations for corrective measures are supplied. Parents should understand that most kinds of agricultural work require a well-balanced combination of brawn and brain. No student whose physical condition is questionable will be accepted for placement training without a physician's certificate, and parent's approval.

It should be clearly understood by both employer and employee that the same energy, regularity and general conduct will be expected of the student during his period of placement training as is expected in his work in classes and on the campus.

It should also be noted that this six months' experience is educational in its nature. Students are expected to earn and receive a reasonable wage, but the purpose of the training is the experience gained rather than the wage earned. The scale of wages may vary in different localities, but each man's ability is given very careful thought, that he may obtain a wage that is fair to him. In the event of any misunderstanding the supervisor should be immediately informed.

RULES AND REGULATIONS

Absences from Class

(1) No unexcused absences will be allowed from classes. (2) all excuses for absence shall be presented by the student in writing, and, if approved by the Director, an excuse card will be granted to be signed by the instructor. Excuse cards must be returned promptly to the office when properly signed. (3) Students presenting excuse cards covering absences are expected to make up all work missed, to the satisfaction of the instructor. (4) Absences for which no excuse card is presented shall be counted as zero in determining grades. (5) **No excuses will be accepted at the Short Course office unless presented within two days after the student returns to classes. (6) Two tardinesses unexcused shall count as one absence. (7) Absences from classes immediately before or after a holiday are not allowed except by special permission. (8) Students failing to observe these rules are placed on probation, and may be asked to withdraw from the course if further violations occur.**

Absences from Examinations or Tests

(1) Any student who absents himself from an appointed examination without sufficient cause shall be given zero thereon. In such case he shall not be entitled to a make-up examination unless the Director so requests. A previously announced test may, at the discretion of the instructor, be regarded as a test or as an examination.

(2) Every absence taken before enrollment (the signing of the registration card by the teacher) in a class will be counted.

General Information

Instruction.—The instruction is given by the regular faculty by means of classroom teaching, laboratory exercises and practical work. The work of the classroom is supplemented by demonstration work in the laboratory, dairy room, greenhouse and stables. It is designed to offer plain, practical, direct information, and to establish the underlying reasons as well as the method employed in the various operations. The advantages of the college staff of specialists and the college plant with all its resources are thus made available to young men and women electing this course.

Entrance Conditions.—Students must be seventeen years of age or over and have completed at least an elementary school course or its equivalent. They must have completed six months' practical experience approved by the supervisor of placement training before they will be permitted to enroll for the work of the second year.

The Stockbridge School of Agriculture is not intended for students already enrolled in high schools. Such students should finish the high school course. Students enrolled in high schools who wish to take the course should bring a statement, either from the principal of the high school or from the parent or guardian, requesting enrollment.

Graduates of county schools of agriculture or of agricultural departments of high schools may complete the course for a diploma in one year, if they are recommended by the Director of the school or the agricultural instructor.

Scholarship in agricultural subjects and practical experience must be satisfactory. When this is deficient, the diploma may be withheld until the placement training of six months is completed for required credits.

Credit and Diploma.—In order to obtain a diploma a student is expected to have satisfactorily completed all the work called for in the general course which he has selected. A student failing to meet the requirements in his six months' summer training cannot be enrolled for his second year.

A credit is given for one class hour, of either recitation or lecture, per week throughout a term of twelve weeks. Each two-hour laboratory period also counts for one credit. Upon the satisfactory completion of the course, the student is awarded the diploma of the School. **A diploma will not be issued to any student whose records shows a deficiency in any subject or in his placement training.**

Scholarship.—At the close of each term students receive a formal report showing the standings given in the subjects pursued by them. If a student is below passing grade in 50 per cent, or more, of his work he may be asked to withdraw.

If a student's term mark in any subject falls below 60 per cent, or if he drops a course without the consent of the Director, he is thereby failed (F) in that subject. He shall be debarred from taking the final examination in that subject and must repeat it with the following class.

If the average of the term mark and the final examination is below 60 per cent, the student is thereby conditioned (#).

How to Enroll.—Each student is required to file with the treasurer of the college a statement, signed by the town (or city) clerk of the town (or city) from which he enrolls, stating that the parent or guardian of the student is a resident of that town. A blank for this purpose is inserted at the end of this catalogue. Upon arrival report at the office of the Director of Short Courses, located in South College, where information may be obtained in regard to board and room, schedule of classes, etc.

Student Expenses

Tuition.—A tuition fee of $20 per term is charged students, residents of Massachusetts, enrolled in the Stockbridge School of Agriculture. Students who are not residents of Massachusetts are charged a tuition fee of $60 a term. The tuition charged persons not citizens of the United States is $60 a term. **Students entering from Massachusetts are required to file with the President a statement signed by either town or city clerk, stating that the applicant's father is a legal resident of Massachusetts.**

All students entering the college for the first time in this course are charged a matriculation fee of $5, which, in event of a student leaving the institution shall, if all bills due the college are paid, be remitted, or which shall upon graduation be considered as payment for the diploma.

The necessary college expenses are estimated as follows:—Tuition: citizens of Massachusetts, $20 per term, or $40 for the first six months of class work (two terms), and $60 for the second year of nine months (three terms); total tuition charge for the two-year course, $100.

	First Year	Second Year	Total
Matriculation fee	$5 00	—	$5 00
Room in private houses	72 00	$108 00	180 00
Board at college dining hall, $7.50 per week	165 00	235 00	400 00
(Men students of the Stockbridge School are not required to eat at the College dining hall.)			
Laundry, $.50 to $.85 a week	20 00	30 00	50 00
Laboratory fees, average	10 00	15 00	25 00
Books, stationery, and miscellaneous items	30 00	45 00	75 00
Totals	$302 00	$433 00	$735 00
Mass. Student tuition	40 00	60 00	100 00
Grand Total	$342 00	$493 00	$835 00

INITIAL CHARGES

At the opening of the college year, before students are registered in their classes the following charges are payable at the treasurer's office.

Matriculation fee	$5 00	—
Board (at college dining hall) October 2 to December 1	61 00	$61 00
Assessment for support of Social Union	1 50	1 50
Laboratory fees	See schedule	See schedule
Student tax for support of athletics[1]	15 00	15 00
Student tax for support of non-athletic activities[1]	3 00	3 50

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[1] While this is not essentially a college charge, the Treasurer of the college acts as collector for the student activity, and all students are expected to make the payment as indicated. The subscription price of the "Collegiau" is fixed by the managers, the amount of athletic tax by vote of the student body.

LABORATORY FEES

The principles observed in establishing laboratory fees are the requirement that students pay for those materials actually used which cannot be supplied by the individual, and that the laboratory fees include a charge sufficient to guard against wanton waste and breakage. Fees may be established for any course without previous announcement. At present the fees charged are as follows:—

	Per Term
Agricultural Engineering S-1, S-2, S-3, S-4, S-5, S-6, S-7	$1 50
Animal Husbandry S-1, S-5	1 50
Animal Husbandry S-4	1 00
Bacteriology S-2	5 00
Dairying S-1, S-2, S-3, S-4	3 00
Flower Growing S-3, S-5	3 00
Flower Growing S-6	5 00
Home Economics S-2	4 00
Horticulture S-1	1 00
Horticulture S-5, S-6, S-7	1 50
Poultry S-1, S-2, S-3, S-4, S-5	2 00
Soils and Crops S-1	1 50
Soils and Crops S-2	2 00
Vegetable Gardening S-1, S-2	1 50

The six months' placement training between the first and second years enables a student to earn from $300 to $450 depending upon his skill and general ability, and the type of work. Of this amount $200 to $300 should be saved to apply to the expenses of the second year.

Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial obligations voluntarily placed upon students which they should expect to meet. Chief among these are class assessments and taxes levied for maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, etc. Such expenses vary from $15 to $30 a year. Additional financial responsibility is also assumed by students joining clubs or entering into other social activities of the college. Besides the amount necessary for clothes and traveling, the economical student will probably spend between $400 and $500 per year.

Student Aid

SELF HELP.—Many students are obliged to find work of some sort to earn their way through college. It is recommended that no new student enter without having at least $250 and preferably $350 with which to pay his way until he can establish himself in some regular work. **The college does not encourage students to enter without money in the expectation of earning their way entirely.** The student will find it better either to work and accumulate money before coming to college, or to take more than two years in completing his course, or, instead, to borrow money sufficient to carry him through. No student should undertake work that interferes with his studies, and students should understand that, owing to the large number of applications for employment, no one man can receive a large amount of work at the college. A number of students find opportunities for earning money without depending upon the college to furnish them with work.

Students whose deportment or class work is not satisfactory are not likely to be continued in student labor. **Opportunities for labor for Short Course men on the campus are limited to second-year men.** Students, therefore, may find it rather difficult to obtain all the work they desire during their first year; as a matter of fact, however, any student who is capable of doing a variety of things, and who is a competent workman, usually finds little difficulty in obtaining all the work that he can do from the outset.

Rooms

Students must secure rooms approved by the college. The assignment of rooms, and the general supervision of the housing of students, is in charge of the Director of Short Courses.

Women students are expected to occupy rooms in the college dormitory and such houses or apartments as the college may provide, and board at the college dining hall. No woman student will be allowed to room in a private house without special permission from the Director.

General Exercises

Chapel exercises are held two mornings each week. On Wednesday an afternoon assembly is held, to which some prominent layman or professional man is invited to speak. The object of these assemblies is to bring to the students discussions of topics of present-day interest. A special chapel service on Sunday is usually held during the winter months. Students are required to attend these general exercises, although the Director is authorized to excuse from Sunday chapel any student who may object to attendance thereon because of his religious scruples. Freshmen must attend during the first term.

Student Activities

A large number of student organizations furnish opportunity to students for work and leadership.

The Massachusetts Agricultural College Social Union was established about fifteen years ago. All students become members of the Union by paying a small fee, and in the fall and winter months the Union gives a series of entertainments, free to students and faculty. The Memorial Building is the center of student activities. Offices for the various student organizations, including the Stockbridge School Student Council, are maintained in this building. On the first floor are located a lounging room, the Memorial Room, and the offices; in the basement, bowling alleys, pool tables, store, post office, and barber shop; and on the second floor an auditorium for meetings and dances. This building was erected by the alumni, students, faculty, and friends in honor of the fifty-one "Aggie" men who gave their lives in the World War.

The Young Men's Christian Association is active both socially and religiously.

The Stockbridge School Council is composed of representatives of the first and second year classes. This body serves as general director of conduct in classes, and represents before the faculty the interests of this group of students.

A student year-book called "The Shorthorn" is published annually by the members of the graduating class, and is usually issued in June.

A School Glee Club brings together during the winter months those who are interested in singing, and for those students who play musical instruments there is a School Orchestra.

In the place of fraternities the faculty have authorized social organizations called "clubs" in the Stockbridge School. There are two such organizations in the student body, the A. T. G. Club and the Kolony Klub.

Athletics.—The School has its own separate athletic program with regular schedules in football, basketball, ice hockey, and baseball for the seniors. Freshman are on placement training during the spring term so that only seniors are available for baseball. This work is all under the supervision and direction of the Department of Physical Education of the College and coaches are provided for all sports. Students also subscribe to the College varsity games and have attendance privileges for varsity sports on the campus. Sweaters and insignia are awarded to Stockbridge School athletic teams. The official insignia is the letter S.

Plans are under way to secure funds for a new building to house all athletic activities of the College. Ample facilities will then be provided to carry on a very complete program of sports and recreation for Stockbridge School students.

Student Relations

The customary high standard of college men in honor, manliness, self-respect, and consideration for the rights of others constitutes the standards of student deportment.

Any student known to be guilty of dishonest conduct or practice must be reported by the instructor to the President for discipline.

The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable.

It should be understood that the college, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet if in the judgment of the college authorities a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct.

Infirmary

The college maintains an infirmary for the care of sick or injured students. The buildings now available for this purpose are quite inadequate for the needs of the institution, and it is hoped that in the near future other buildings of this kind may be erected and the general equipment somewhat amplified. At present two small buildings, built especially for hospital purposes, are used for the infirmary.

The following statement outlines the plan followed in the management of the infirmary with respect to students:—

Management of the Infirmary

Supervision

1. The infirmary is under the *general supervision* of Professor Curry S. Hicks, who is designated as Supervisor of the Infirmary. A resident nurse is in *immediate* charge of the Infirmary.

Use of Infirmary

2. Students are urged to go to the infirmary at any time that they are in need of the services rendered by the resident nurse or by a town physician. Inasmuch as the physical director gives special attention to all student diseases, it is to be expected that the majority of the students will go to the infirmary at his suggestion. This understanding, however, should in no way deter students from going to the infirmary voluntarily at any time.

General Health

3. Students are urged to consult the physical director or the resident nurse immediately when signs of physical disorder appear. Severe attacks of cold or other forms of illness can usually be avoided if treatment is administered in the incipient stage. The purpose of the infirmary is to help maintain the general good health of the students, as well as to furnish a suitable place for professional attention in cases of severe illness or accidcent.

General Fee

4. The infirmary fee will be at the rate of $2 a day, and will be charged when one or more meals are obtained at the infirmary or when the student remains at the infirmary for one or more nights. A nominal charge will be made to outpatients for miscellaneous treatment of a minor character.

Additional Expenses

5. In addition to the fee charged as specified in paragraph 4, the following additional expenses will be charged to the patient:—

(*a*) *Nurses.*—In case a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient. Such a nurse will be under general supervision of the resident nurse.

(*b*) *Professional Service.*—If a student requires medical attention by a physician, he will be required to select his physician and become responsible for fees charged by the physician.

(*c*) *Supplies.*—Special medical supplies prescribed by a physician or nurse will be charged to the patient.

(*d*) *Laundry.*—Expense for personal laundry incurred by students while in the infirmary will be charged to the individual student.

The Library

The College Library occupies the entire building formerly partly occupied by the chapel. It contains more than 81,300 bound volumes and a very large collection of pamphlets, probably twice as numerous, which are of great practical value, being monographs on the technical subjects studied in the college. These pamphlets include particularly the publications of the United States Department of Agriculture and those of the State Experiment Stations of other Agricultural colleges in this country and abroad. Among the bound volumes, works on agriculture, horticulture, botany, entomology and the various sciences connected especially with agriculture predominate, but literature, history, economics, religion, sociology and art are also well represented. More than six hundred periodicals covering technical and general subjects, and including the best farm papers, are regularly taken and both the current numbers and the back files are readily accessible.

The Library is open for readers from 8 A. M. to 10 P. M. during term time and during part of Sunday. Vacation hours are somewhat shorter.

Short Course Students will find in the Library helpful material of many sorts in connection with their work, and are cordially invited to make use of this material. The librarian and library assistants are always on hand, ready and anxious to help.

Agricultural Opportunities for Women

Agriculture is a field in which women are finding increasingly good opportunities. Poultry keeping, fruit growing, floriculture, dairying, truck farming, general farming,—all offer favorable openings for women. In all of these branches of agriculture women are farming independently. Women are also filling paid positions which include farm and estate managers and workers, garden supervisors, and workers in boys' and girls' agriculture clubs.

For the woman or girl whose home is already upon the farm the opportunity is exceptionally good. With the help of an agricultural education there are open to her many means of increasing her own or the farm income. With the knowledge of farm life which she already possesses, and with the possibility of securing occasional help from her family, she can easily carry on and develop a profitable enterprise of her own. The Stockbridge School of Agriculture will afford to the women who wish to engage in farming the practical training which they will need to fit them for their work, and will open to them new doors of opportunity. The particular problems which the women engaged in farming will have to meet, and the special lines of farming in which they will have favorable opportunities, will be considered in a series of conferences.

Women who are interested in taking agricultural courses should correspond with Miss Margaret Hamlin, who acts as advisor for agricultural courses for women. Women interested in home economics should address Professor Edna L. Skinner.

Positions

The College does not guarantee positions to students registered in any of its courses, but it has an opportunity to recommend students for a large number of positions. A record is kept of each student's work and experience, and of his success in positions for which he has been recommended after he has finished his course. The opportunities for trained men and women, especially those who have had farm experience, are exceptionally good.

A student desiring a recommendation from the college must meet the following conditions:—

(1) He must be of good character.
(2) His previous record must be good.
(3) His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of practical experience cannot, as a rule, be recommended for positions of responsibility. This is especially true of the better positions for which managers or superintendents are wanted.

ANIMAL HUSBANDRY

The Animal Husbandry major fits students to cope with the practical problems of live stock production and management. It supplements and supports but does not duplicate or replace the necessary experience gained only through actual manual work in caring for animals. As a foundation, the study of breed history, live stock trends, animal anatomy and physiology is required. Special attention is given to physiological processes in breeding and feeding. Later courses show how these processes actually function under the stockman's guidance.

A herd of about 200 dairy cattle including Ayrshires, Guernseys, Jerseys, Holsteins and Milking Shorthorns, a band of about a dozen Percheron brood mares, a flock of about 60 Southdown and Shropshire sheep and a herd of about 50 Berkshire and Chester White swine together with the modern barns and equipment for housing and caring for the above live stock and a farm of several hundred acres used primarily for the production of feed crops gives ample scope for illustrating and giving practice in modern methods of live stock handling. The farm and barns are our laboratory; the animals and accessories our equipment.

Graduates from the Animal Husbandry major for the most part secure positions as herdsmen or farm managers.

Animal Husbandry

First Year

Fall Term	Winter Term	Spring Term
Agricultural Opportunities S-1 (Required of women students) Animal Husbandry S-1 (Types and Breeds) Bacteriology S-1 (Bacteriology and Rural Hygiene) Business Law S-1 Dairy S-1 (General Dairy) Poultry Raising S-6 (General course in Poultry Raising) Soils and Crops S-1 (Soil Management) *Physical Education S-1 Physical Education S-3 (Hygiene—required of men students) Tractor Practice	Agricultural Engineering S-2 (Motors) Animal Husbandry S-2 (Principles of Feeding) Bacteriology S-2 (Continuation of Bacteriology S-1) Business Law S-2 (Continuation of Business Law S-1) Soils and Crops S-2 (Fertilizers) Physical Education S-2 (Required of women students) Milking, Harnessing and Teaming	Six months' placement training
Electives	**Electives**	
English S-1 (Required of students having less than two years of High School) Home Economics S-5 (Home Furnishing) *Physical Education S-1 is required of men students not participating in football; also required of women students.	Home Economics S-2 (Foods) Physical Education S-4 (Basketball and Hockey)	

Second Year

Fall Term	Winter Term	Spring Term
Agricultural Economics S-1 (Farm Economic Problems) Agricultural Engineering S-1 (Farm Engineering) Agricultural Engineering S-3 (Carpentry) Agricultural Engineering S-7 (Farm Structures) Animal Husbandry S-3 (Feeding Practice in Live Stock other than Dairy Cattle) Farm Management S-1 (Farm Management and Accounts) Physical Education S-2 (Required of men students not participating in football)	Agricultural Economics S-2 (Marketing) Animal Husbandry S-4 (Animal Breeding and Herd Book Study) Farm Management S-2 (Continuation of Farm Management S-1) Fruit Growing S-10 (General course in Fruit Growing) Rural Sociology S-1 (Social and Economic Problems)	Animal Husbandry S-5 (Dairy Cattle Production and Equitation) Rural Sociology S-2 (Continuation of Rural Sociology S-1) Soils and Crops S-3 (Field Crops) Vegetable Gardening S-6 (Principles of Vegetable Growing) Veterinary Science S-1 (Animal Sanitary Science)
Electives	**Electives**	**Electives**
Physical Education S-3 (For women)	Animal Husbandry S-7 (Farm Meats) Forestry S-1 (Woodlot Management) Physical Education S-4	English S-3 Physical Education S-5 (Baseball)

Animal Husbandry S-1. (Types and Breeds.) I.

Includes a study of the history and development of the various breeds of cat-

tle, horses, sheep and swine together with a discussion of the conditions to which each breed seems best adapted. Laboratory work consists of judging and evaluating as many rings of all the classes of farm live stock as time will permit. Textbook: Plumb, "Types and Breeds of Farm Animals."
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Animal Husbandry S-2. (Principles of Feeding.) II.

A study of the fundamental principles of animal nutrition, of the composition of feeding materials and their relative importance for the different classes of farm animals in New England. The latter part of the course is devoted to a study of feeding standards and to the calculation of rations for all classes of farm live stock. Textbook: Henry and Morrison, "Feeds and Feeding."
5 class hours a week. Credits, 5.

Animal Husbandry S-3. (Feeding Practice in Live Stock other than Dairy Cattle.) I.

A continuation of S-2 showing the application of the principles of nutrition in economic live stock production and including the management and feeding of horses, beef cattle, sheep and swine. Feeding and managerial problems are assigned for outside work followed by ample classroom discussions. Prerequisites: Animal Husbandry S-1 and Animal Husbandry S-2. Textbook: Henry and Morrison, "Feeds and Feeding."
5 class hours a week. Credits, 5.

Animal Husbandry S-4. (Animal Breeding and Herd-Book Study.) II.

Includes a study of the physiology of reproduction and of animal genetics as well as the art of breeding. Among the topics included are the Origin and Domestication of Farm Animals; Modern Theories of Heredity, Variation and Sex Determination; the Systems of Breeding—Cross-, Out-, Line-, and Close-Breeding; and the one paramount problem of animal breeding, namely, Selection. Considerable pedigree work in the student's favorite breed is also included. Prerequisites: Animal Husbandry S-1 and Animal Husbandry S-2. Textbook: Rice, "Breeding and Improvement of Farm Animals."
4 class hours and 1 2-hour laboratory period a week. Credits, 5.

Animal Husbandry S-5. (Dairy Cattle Production and Equitation.) III.

Seven weeks of the term will be devoted to the consideration of matters pertaining to the feeding, fitting for show and showing, judging and management of dairy cattle. Problems will be assigned for outside work followed by classroom discussions. There will be talks by specialists and laboratory work in judging and fitting for show and showing.

The last three weeks of the term will be devoted to lectures covering the feeding, selection and management of riding or cavalry horses and practice in riding. The riding practice will consist of drills on the military field and cross-country trips by arrangement with the military department. Prerequisites: Animal Husbandry S-1, Animal Husbandry S-2, Animal Husbandry S-3, Animal Husbandry S-4.
5 2-hour laboratory periods a week. Credits, 5.

Animal Husbandry S-6. (General Animal Husbandry.) II.

Consists of a general study of animal husbandry; types and market classes of live stock, breeds of farm animals, principles and practice of feeding, live stock breeding; and management of herds, flocks and studs. Laboratory work is given in live stock judging and management. As much detail of this broad subject is given as is consistent with time allotted. Textbook: Plumb, "A Study of Farm Animals."
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Animal Husbandry S-7. (Farm Meats.) II.

This course is the complement of the production course previously given and permits the student to follow the product (beef, pork, veal and lamb) through the farm barn and feed lot to its final destination, the consumer's table. Practice is afforded in the killing, cutting and curing of beef, pork, veal and lamb. Included in this course is a trip to several large packing houses in Boston, consuming two days and costing about $20. Prerequisites: Animal Husbandry S-1, Animal Husbandry S-2, Animal Husbandry S-3. Textbook: Tomhave, "Meat and Meat Products."

1 class hour and 1 4-hour laboratory period a week. Credits, 3.

NOTE.—Every student in this course must qualify in tractor practice, milking, harnessing, and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put in placement training who has not satisfied these preliminary requirements.

DAIRY MANUFACTURES

The Dairy Manufactures course is designed to fit men for positions with market milk concerns, creameries, ice-cream factories, and specialized dairy farms.

All dairy manufacturing work is given in the dairy building (Flint Laboratory), a modern building designed especially for dairy work. The building is equipped with the newest and best types of dairy and creamery machinery.

The market milk room contains two complete pasteurizing units, a clarifier, separator, milk heater, automatic bottle filler and capper, and other necessary equipment for the proper handling of market milk.

The ice-cream making room contains a brine freezer, a direct expansion freezer, and additional equipment such as is found in a modern ice-cream plant.

The room designed for cheese making is equipped with cheese vats, draining racks, presses, mixer, etc. The butter making room has various types of hand and power churns, workers, scales, and other accessories.

The separator room contains a complete collection of separators and exhibits of modern equipment and supplies for the dairyman.

The testing laboratories are well equipped with apparatus for the Babcock and Mojonnier tests.

Dairy Manufactures

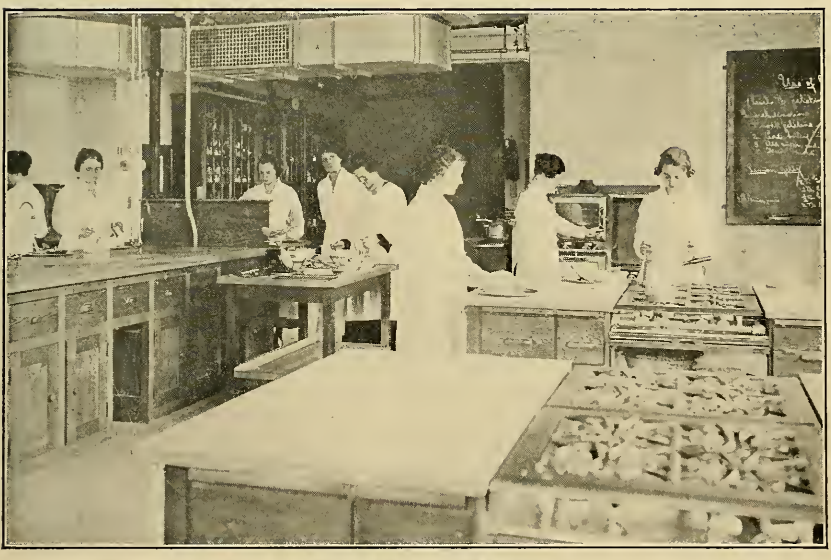
First Year

Fall Term	Winter Term	Spring Term
Agricultural Opportunities S-1 (Required of women students) Animal Husbandry S-1 (Types and Breeds) Bacteriology S-1 (Bacteriology and Rural Hygiene) Business Law S-1 Dairy S-1 (General Dairy) Soils and Crops S-1 (Soil Management) *Physical Education S-1 Physical Education S-3 (Hygiene—required of men students)	Agricultural Engineering S-2 (Motors) Animal Husbandry S-2 (Principles of Feeding) Bacteriology S-2 (Continuation of Bacteriology S-1) Business Law S-2 (Continuation of Business Law S-1) Soils and Crops S-2 (Fertilizers) Physical Education S-2 (Required of women students)	Six months' placement training
Electives	**Electives**	
English S-1 (Required of students having less than two years of High School) Home Economics S-5 (Home Furnishing) *Physical Education S-1 is required of men students not participating in football; also required of women students.	Home Economics S-2 (Foods) Physical Education S-4 Basketball and Hockey)	

Second Year

Fall Term	Winter Term	Spring Term
Agricultural Economics S-1 (Farm Economic Problems) Bacteriology S-3 (Dairy Bacteriology) Dairy S-2 (Ice Cream Making) Farm Management S-1 (Farm Management and Accounts) Physical Education S-2 (Required of men students not participating in football)	Agricultural Economics S-2 (Marketing) Dairy S-3 (Market Milk) Farm Management S-2 (Continuation of Farm Management S-1) Rural Sociology S-1 (Social and Economic Problems)	Agricultural Engineering S-5 (Dairy Mechanics) Dairy S-4 (Butter making and other products) Rural Sociology S-2 (Continuation of Rural Sociology S-1) Veterinary Science S-1 (Animal Sanitary Science)
Electives	**Electives**	**Electives**
Physical Education S-3 (For women)	Physical Education S-4	English S-3 Physical Education S-5 (Baseball)

Ice Cream Making



A Class in Cooking

Dairy S-1. (General Dairy.) I.

This course takes up the question of the importance of dairying in the United States, and especially in the New England States, giving the development of dairying from the earliest to the present time. It covers the secretion, composition, and properties of milk; reasons for variation in the per cent of fat in different samples of milk; the Babcock test for fat in milk and other dairy products; other common milk tests; the advantage of testing herds, cow test associations, advanced registry work; the handling of market milk; soft cheese making, ice-cream making, and butter making as applied to general farm conditions. The laboratory work consists mainly in testing milk and dairy products for butter fat, solids, and acidity, together with some laboratory work in milk handling, butter making, cheese making, and ice-cream making.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Dairy S-2. (Ice-cream Making.) I.

In this course a careful study is made of modern methods of manufacturing the common frozen dairy products (ice-cream, sherbets, and ices, also frozen puddings, punches, mousses, etc.).

The lecture work includes a discussion of the history of ice-cream making, the ingredients found in ice-cream, methods of preparing and standardizing mixes, the freezing process, methods of hardening, marketing, and distribution of the finished product.

The laboratory work involves the preparation and standardization of ice-cream mixes, the freezing of ice-cream and other frozen dairy products, and laboratory tests for butter fat and total solids in ice-cream.
4 class hours and 3 3-hour laboratory periods a week. Credits, 9.

Dairy S-3. (Market Milk.) II.

This course takes up the history of market milk, its food value and use. Attention is given to the necessary essentials in producing a clean product; the economics of milk production; the advantages of co-operative milk producers' organization; the various methods of marketing milk; clarification; pasteurization; cooling, etc.

The laboratory work consists of receiving and making quality tests on milk and the operation of the machinery used in processing market milk. In addition, trips to dairy farms and a one-day trip, with estimated cost of $5.00, will be made to city milk plants.
4 class hours and 3 3-hour laboratory periods a week. Credits, 9.

Dairy S-4. (Butter Making and Other Dairy Products.) III.

A large part of this course consists of the study of butter making; other products are, cheese and "surplus products."

Under butter making the principal factors studied are: methods of separating milk, the history, selection, care, and use of separators; the pasteurization and ripening of cream; testing cream for acidity; the making and use of starters; a study of churns and churning; modern methods of making butter; marketing butter; tests for moisture, salt, fat, and curd content of butter.

Lectures are given covering the manufacture of other milk products (cheese, commercial buttermilk, casein, condensed milk, milk powder, etc.). The manufacture of hard and soft cheeses (cheddar, pimento, olive, nut, neufchatel, cottage, etc.) is considered, either from the standpoint of marketing the entire milk supply of the dairy through these products or the economic disposal of surplus milk.

The laboratory work covers the operation of separators and churns, the making of butter, hard and soft cheese, commercial buttermilk, etc. In addition, a one-day trip, with estimated cost of $5.00, will be made to city dairy plants.
4 class hours and 3 3-hour laboratory periods a week. Credits, 9.

POULTRY RAISING

Seven courses are offered by this department. One is a general course designed particularly to equip the student with fundamental principles underlying successful poultry raising as related especially to the farm flock. The other six courses are for the student who desires to specialize in poultry culture.

There is a broad field of opportunity for adequately trained men in the commercial handling and sale of poultry and poultry products, specialists in incubation, brooding and rearing, and assistants or managers of commercial poultry farms. Good profits and wages await well-equipped men and women in these and other branches of poultry work.

This department is well equipped to offer practical instruction in poultry husbandry. Our quarters and equipment in Stockbridge Hall provide ample facilities for efficient classroom and laboratory teaching.

Our practical laboratory (college poultry plant) comprises about 1,500 adult birds, divided into some 40 pens of various designs, the flocks ranging in size from 10 to 250 birds; thirty lamp incubators, as well as four mammoth machines; brooding and rearing facilities for 5,000 chicks, including many styles of coal, kerosene and electric brooders and batteries; facilities for practice in feeding, fattening, killing, picking, caponizing, judging, mixing rations; construction of poultry houses and appliances, etc.

In addition to the actual practice work performed, the student has an opportunity to keep under observation practical experiments and demonstrations continually under way for the instruction of students and practical poultry keepers.

Poultry Raising

First Year

Fall Term

Agricultural Opportunities S-1 (Required of women students)
Bacteriology S-1 (Bacteriology and Rural Hygiene)
Business Law S-1
Dairy S-1 (General Dairy)
Poultry Raising S-1 (Judging and Housing)
Soils and Crops S-1 (Soil Management)
*Physical Education S-1
Physical Education S-3 (Hygiene—required of men students)
Tractor Practice

Electives

English S-1 (Required of students having less than two years of High School)
Home Economics S-5 (Home Furnishing)

*Physical Education S-1 is required of men students not participating in football; also required of women students.

Winter Term

Agricultural Engineering S-2 (Motors)
Animal Husbandry S-6 (General Animal Husbandry)
Bacteriology S-2 (Continuation of Bacteriology S-1)
Poultry Raising S-2 (Incubating and Brooding)
Soils and Crops S-2 (Fertilizers)
Physical Education S-2 (Required of women students)
Milking, Harnessing and Teaming.

Electives

Business Law S-2 (Continuation of Business Law S-1)
Home Economics S-2 (Foods)
Physical Education S-4 (Basketball and Hockey)

Spring Term

Six months' placement training.

Second Year

Fall Term

Agricultural Economics S-1 (Farm Economic Problems)
Agricultural Engineering S-3 (Carpentry)
Agricultural Engineering S-7 (Farm Structures)
Poultry Raising S-3 (Feeding and Marketing)
Poultry Raising S-7 (Physiology, Sanitation and Disease Control)
Fruit Growing S-4 (Small Fruits)
or
Flower Growing S-1 (Garden Flowers and Bedding Plants)
Physical Education S-2 (Required of men students not participating in football)

Electives

Physical Education S-3 (For women)

Winter Term

Agricultural Economics S-2 (Marketing)
Agricultural Engineering S-4 (Repair of Farm Equipment)
Farm Management (Farm Management and Accounts)
Poultry Raising S-4 (Breeding)
Rural Sociology S-1 (Social and Economic Problems)
Fruit Growing S-10 (General course in Fruit Growing)
or
Forestry S-1 (Woodlot Management)

Electives

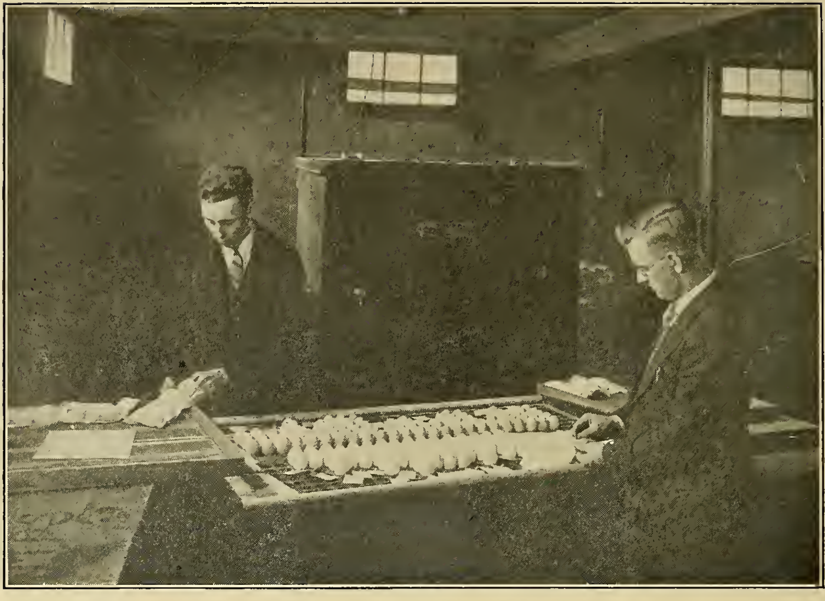
Physical Education S-4

Spring Term

Farm Management S-2 (Continuation of Farm Management S-1)
Poultry Raising S-5 (Managing the Poultry Farm)
Rural Sociology S-2 (Continuation of Rural Sociology S-1)
Soils and Crops S-3 (Field Crops)
Vegetable Gardening S-6 Principles of Vegetable Growing)
or
Veterinary Science S-1 (Animal Sanitary Science)

Electives

English S-3
Physical Education S-5 (Baseball)



Students Starting a Pedigree Hatch

Field Study of Tillage Implements

Poultry S-1. (Judging and Housing.) I.

This course embraces a study of the various economically important types and breeds of domestic fowl, judging for egg production capacity, and for exhibition quality. A visit to one Connecticut Valley poultry show may be required. This course also covers the principles and practices of constructing and equipping houses on a commercial poultry farm. Three hours for judging; two hours for housing.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Poultry S-2. (Incubating and Brooding.) II.

A study of incubation and brooding is made by means of the operation of standard incubators and brooders and through a consideration of basic principles. Students select and grade hatching eggs; complete a hatch in small incubators and run mammoth incubators for a period of time. Under supervision each student has charge of a brood of chicks.
2 class hours and the equivalent of 3 2-hour laboratory periods. Credits, 5.

Poultry S-3 (Feeding and Marketing.) I.

A study of the common poultry feeds, feeding principles and successful commercial farm practices. This course also covers candling and grading eggs, market classification of poultry and eggs, judging eggs, fattening, killing, picking, drawing, and judging of live and dressed market poultry. The general breeding and care of ducks, geese, squabs, and turkeys will also be included. Four hours for feeding; marketing and specialties two hours.
4 class hours and 2 2-hour laboratory periods a week. Credits, 6.

Poultry S-4. (Breeding.) II.

This course includes the study of the improvement of poultry by means of mass selection, "seed-plot" and pedigree methods of breeding. Students follow through each step of a pedigree hatch and assist in the selection of the breeders used at the college plant. Basic principles of heredity necessary for an understanding of good breeding practices are studied.
3 class hours and 2 2-hour laboratory periods per week. Credits, 5.

Poultry S-5 (Managing the Poultry Farm.) III.

In this course the following points are given special attention: lines upon which a well-organized poultry farm is developed, the general arrangement of plots and buildings, record keeping, accounting and advertising, and a study of surveys. A trip covering three or more days will be made to representative successful poultry farms. The expense per student is approximately $15-$20. This is required of each student taking the course for credit.
4 class hours and the equivalent of 1 2-hour laboratory period per week.
Credits, 5.

Poultry S-6 (General Poultry Raising.) I.

Poultry keeping as a national industry; its importance and geographical distribution; opportunities and possibilities in poultry culture in Massachusetts; principles of feeding; utility classification of fowl; incubation; the production of hatching eggs; the baby chick industry; and brooding and rearing. Practical exercises will be closely correlated with the breeds and varieties, studies of various types and sizes of incubators, brooders, and brooder houses. "Practical Poultry Management" by Rice and Botsford will be used as a text.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

NOTE.—Students who take course 6 must get permission from the Poultry Department to take advanced poultry courses.

Poultry S-7. (Physiology, Sanitation and Disease Control.) I.

This course aims to acquaint the student with the normal hygienic conditions under which our domestic poultry thrive best. Sufficient anatomy and physiology will be given to enable the student to distinguish between normal and abnormal conditions. The nature of disinfectants and external and internal anti-

septics will be stressed and the students made acquainted with the best usages both scientific and practical in conducting a sanitary program for disease prevention and control. A special effort will be made to link the sanitary, hygienic, and disease control problems with the so-called down-to-date practices in feeding, housing and general management.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

NOTE.—Every student in this course must qualify in tractor practice, milking, harnessing, and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put in placement training who has not satisfied these preliminary requirements.

FLOWER GROWING

Students who complete the course in flower growing are fitted primarily for work in commercial and private estate greenhouse establishments and retail flower stores. After gaining experience, such students may be able to start in business for themselves. With the courses in general horticulture they should also be qualified for positions on private estates, in parks, or in nurseries.

The offices and class rooms of the Department of Floriculture are located in French Hall. Of the two lecture rooms, one will accommodate 40 students, the other 90 students; a laboratory, equipped with slate-covered tables, will accommodate 40 students. In the basement of the building the department has a specially prepared room for bulb storage, a fertilizer and tool room, and a large room for general storage purposes.

The glass area of the department consists of approximately 20,000 square feet, divided as follows: French Hall, range of 7,200 square feet, a durable, practical commercial range, composed of palm and fern, sweet pea, carnation, rose, and students' houses; the old Durfee range of 7,400 square feet, devoted to the growing of decorative, conservatory and bedding plants and chrysanthemums; one house of 3,200 square feet suitable for propagating work and general plant culture; and approximately 2,200 square feet in cold frames and hotbeds.

In addition, the department has 2 acres of land used for summer culture of carnations, gladioli, dahlias, sweet peas and bedding plants; a perennial garden, an annual garden and a rose garden.

Flower Growing

First Year

Fall Term

Agricultural Opportunities S-1 (Required of women students)
Business Law S-1
Flower Growing S-1 (Garden Flowers and Bedding Plants)
Horticulture S-1 (Propagation of Plant Materials)
Soils and Crops S-1 (Soil Management)
Vegetable Gardening S-1 (Principles of Vegetable Growing)
*Physical Education S-1
Physical Education S-3 (Hygiene—required of men students)
Tractor Practice

Electives

English S-1 (Required of students having less than two years of High School)
Home Economics S-5 (Home Furnishing)

*Physical Education S-1 is required of men students not participating in football; also required of women students)

Winter Term

Applied Mathematics S-1
Business Law S-2 (Continuation of Business Law S-1)
Flower Growing S-2 (Greenhouse Construction and Heating)
Flower Growing S-8 (Greenhouse Management and Propagation)
Horticulture S-2 (Plant Materials)
Soils and Crops S-2 (Fertilizers)
Physical Education S-2 (Required of women students)
Teaming and Harnessing

Electives

Home Economics S-2 (Foods)
Physical Education S-4 (Basketball and Hockey)

Spring Term

Six months' placement training.

Second Year

Fall Term

Agricultural Engineering S-2 (Motors)
Flower Growing S-3 (Commercial Production)
Flower Growing S-6 (Flower Arrangement)
Fruit Growing S-10 (General course in Fruit Growing)
Horticulture S-7 (Park and Estate Maintenance)
Physical Education S-2 (Required of men students not participating in football)

Electives

Physical Education S-3 (For women)

Winter Term

Business Management S-1 (Fundamentals of Business Management)
Flower Growing S-4 (Commercial Production)
Horticulture S-12 (Care of Plant Materials)
Horticulture S-13 (Plant Breeding)
Rural Sociology S-1 (Social and Economic Problems)
Vegetable Gardening S-4 (Vegetable Forcing)

Electives

Physical Education S-4

Spring Term

Business Management S-2 (Continuation of Business Management S-1)
Flower Growing S-5 (Conservatory Plants)
Flower Growing S-7 (Herbaceous Plants and their Uses)
Horticulture S-3 (Plant Materials)
Horticulture S-8 (Construction and Maintenance)
Rural Sociology S-2 (Continuation of Rural Sociology S-1)

Electives

English S-3
Physical Education S-5 (Baseball)

Flower Growing S-1. (Garden Flowers and Bedding Plants.) I.

This course is intended for students who will take up private estate work or who will specialize in floriculture. It will include a study of the annuals, biennials, herbaceous perennials, and bedding plants which are commonly used in commercial floriculture and in private estate work. Methods of propagation, culture and uses will be considered. Laboratory exercises will include work in propagation, planting, study of materials, and planning of beds and borders.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Flower Growing S-2. (Greenhouse Construction and Heating.) II.

This course will take up the origin, growth, and importance of the floriculture industry; development of the greenhouse; types of houses and construction; methods of greenhouse heating. Trips are taken to visit greenhouse establishments in the vicinity of Amherst at a total approximate cost of two dollars. Textbook: White's "Principles of Floriculture."
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Flower Growing S-3. (Commercial Production.) I.

Courses S-3 and S-4 will be devoted primarily to a consideration of the important commercial crops. Special attention will be given to the culture (under glass) of roses, carnations, chrysanthemums, violets, and sweet peas. Other cutflower crops and various potted plants will also be considered. All members of the class are required to take a one-day trip to visit a large commercial greenhouse establishment at an approximate cost of five dollars each. Textbooks required during the two courses will be: Holmes, "Commercial Rose Culture"; and Smith, "Chrysanthemum Manual."
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Flower Growing S-4. (Commercial Production.) II.

A continuation of Flower Growing S-3.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Flower Growing S-5. (Conservatory Plants.) III.

A study of the plants, both foliage and flowering, which are used in conservatories and in decorative work. Methods of propagation, culture, uses and identification of plants will be included in the work. Trips are taken to visit the conservatories at Smith and Mount Holyoke colleges at slight expense.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Flower Growing S-6. (Flower Arrangement.) I.

A study of the principles underlying the use of flowers in funeral designs and sprays, table decorations, corsages, vase, bowl and basket arrangements; decorations for public functions; study of color with regard to such work. Limited to students who are majoring in floriculture. Textbooks: White, "Principles of Flower Arrangement"; Harry, "Manual of Floral Designing".
2 class hours and 2 2-hour laboratory periods a week. Credits, 4.

Flower Growing S-7. (The Uses of Herbaceous Plants.) III.

This course is a continuation of Flower Growing S-1 and is intended for students specializing in floriculture and general horticulture. It provides opportunity for a more detailed study of many of the plants considered in the preceding course, with special emphasis on their uses in gardens and in other types of landscape planting. Lectures, assigned readings, study and identification of plants, planning of borders and gardens. All members of the class are required to take a one day trip to visit nurseries and perennial gardens at an approximate cost of five dollars each.
3 class hours and 1 4-hour laboratory period a week. Credits, 5.

Flower Growing S-8. (Greenhouse Management and Propagation.) II.

A study of the principles and management of greenhouses, including soils, fertilizers, watering, ventilation, temperature regulation, insect and disease control. The methods of propagation of florists' crops will be taken up in detail.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Note.—Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

FRUIT GROWING

This course is arranged to give the student a sound practical knowledge of fruit growing and allied subjects. Graduates who are capable and experienced have advanced rapidly to positions of responsibility in some of the larger orchards of New England, and the demand is active for good men in that field.

Some graduates of this course have gone into business for themselves, establishing successful orchards of their own, or pruning, spraying and otherwise caring for a number of small orchards, the owners of which are not prepared to do their own work. Still others are packing house foremen or are engaged in some other marketing activity. The fruit-growing industry of New England is developing rapidly and the opportunities are excellent for good men who are well trained.

Practical work in the orchards under expert supervision is emphasized where possible. It is intended to familiarize students with the best methods that have been devised by experiment stations and leading fruit growers for the production and marketing of high quality fruits under New England conditions. The Department of Pomology has about fifty acres of fruits easily accessible from the classroom, and the orchards are used freely for purposes of instruction. All the common tree fruits and small fruits are grown here on a commercial scale. Many experiments and demonstrations are in progress in the plantations, offering an exceptional opportunity to the student.

A good equipment is maintained of the principal types of orchard tools and machines. Such implements as sprayers, nozzles, pruning saws, pruning shears, ladders and cultivators are available in great variety for study and trial by students.

Fruit Growing

First Year

Fall Term

- Agricultural Opportunities S-1 (Required of women students)
- Business Law S-1
- Fruit Growing S-1 (Apple Orcharding)
- Poultry Raising S-6 (General Course)
- Soils and Crops S-1 (Soil Management)
- Vegetable Gardening S-1 (Principles of Vegetable Growing)
- *Physical Education S-1
- Physical Education S-3 (Hygiene—required of men students)
- Tractor Practice

Electives

- English S-1 (Required of students having less than two years of High School)
- Home Economics S-5 (Home Furnishing)

*Physical Education S-1 is required of men students not participating in football; also required of women students)

Winter Term

- Agricultural Engineering S-2 (Motors)
- Agricultural Engineering S-4 (Repair of Farm Equipment)
- Agricultural Engineering S-7 (Farm Structures)
- Business Law S-2 (Continuation of Business Law S-1)
- Fruit Growing S-2 (Minor Tree Fruits)
- Fruit Growing S-3 (Pruning)
- Soils and Crops S-2 (Fertilizers)
- Physical Education S-2 (Required of women students)
- Teaming and Harnessing

Electives

- Home Economics S-2 (Foods)
- Physical Education S-4 (Basketball and Hockey)

Spring Term

Six months' placement training.

Second Year

Fall Term

- Agricultural Economics S-1 (Farm Economic Problems)
- Beekeeping S-1
- Fruit Growing S-4 (Small Fruits)
- Fruit Growing S-5 (Harvesting and Packing)
- Horticulture S-13 (Plant Breeding)
- Horticultural Manufactures S-1
- Physical Education S-2 (Required of men students not participating in football)

Electives

- Physical Education S-3 (For women)

Winter Term

- Agricultural Economics S-2 (Marketing)
- Farm Management S-1 (Farm Management and Accounts)
- Fruit Growing S-6 (Storage and Marketing)
- Fruit Growing S-7 (Fruit Pests)
- Rural Sociology S-1 (Social and Economic Problems)
- Animal Husbandry S-6 (General Course)

  or

  Horticultural Manufactures S-2

Electives

- Physical Education S-4

Spring Term

- Beekeeping S-2
- Farm Management S-2 (Continuation of Farm Management S-1)
- Fruit Growing S-8 (Spraying)
- Fruit Growing S-9 (Problems in Orchard Management)
- Rural Sociology S-2 (Continuation of Rural Sociology S-1)
- Vegetable Gardening S-7 (Commercial Vegetable Gardening)
- Soils and Crops S-3 (Field Crops)

  or

  Horticultural Manufacturers S-3

Electives

- English S-3
- Physical Education S-5 (Baseball)

Fruit Growing S-1. (Apple Orcharding.) I.

This course covers the planting and development of apple orchards and the management of bearing plantations to produce high grade fruit. Sites and soils and the best methods for laying out orchards are discussed along with the best methods of setting trees to insure a good start. The handling of young trees to bring them into early profitable bearing is given special attention.

The culture of bearing apple orchards is studied in detail to give an understanding of the factors that influence yield and quality of fruit. Methods of soil management are discussed with the adaptation to common soil types and with reference to their advantages and limitations. The experimental plots afford exceptional opportunities to study cultural methods and many subjects are discussed in the orchards.

3 class hours a week. Credits, 3.

Fruit Growing S-2. (Minor Tree Fruits.) II.

While the apple is and will continue to be our principal tree fruit crop, other tree fruits will always be important here and the well trained man should know how to care for them. This course deals with the planting and care of peaches, pears, plums, cherries and quinces.

3 class hours a week. Credits, 3.

Fruit Growing S-3. (Orchard and Vineyard Pruning.) II.

Fruit plantations may be damaged more by unintelligent pruning than by mismanagement in any other single operation. If the orchardist does not know that apple trees bear on spurs, he is likely to cut them off in pruning, and so reduce his chances for a crop. If he is ignorant of the fact that the peach bears on last year's wood, he may remove most of this wood, and incidentally most of his crop. This course aims to give the student a thorough training in the theory of pruning and the methods of bearing of the different fruits.

At the same time, every student is required to prune in the college orchards and vineyards until he becomes reasonably proficient with each kind of fruit.

1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Fruit Growing S-4. (Small Fruits.) I.

While orcharding will always be the leading phase of fruit growing in Massachusetts, there are many unusual opportunities for success in growing the various small fruits. This course deals with problems of establishing and handling successfully plantations of strawberries, raspberries, blackberries, currants, gooseberries, and grapes.

The college has large plantations of most of these fruits, so the student has ample opportunity for a wide range of practical work. The aim is to make the course of the utmost practical value, as well as to give the scientific principles on which practices are based. Each major student must be prepared to take a trip to one of the fruit sections of the northeastern United States, at a cost of $15 to $25.

3 class hours a week. Credits, 3.

Fruit Growing S-5. (Harvesting and Packing Fruits.) I.

Handling the crop to the best advantage is one of the most important things in successful fruit growing and one which too often is badly managed because the fundamental principles are not understood. The proper time for harvesting is discussed in this course as well as the most satisfactory methods to insure a maximum storage season.

Particular attention is given to packing apples in boxes and barrels, and practice is continued under supervision until the principles are mastered. Many other packages are packed and studied also in relation to the movement of the New England apple crop.

The preparation of fruit for exhibition purposes and the judging of fruit are also considered in this course.

1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Fruit Growing S-6. (Storage and Marketing.) II.

The principles of common and refrigerated storage are considered in detail in this course and storage house construction under New England conditions is discussed, with a critical examination of several storages in use on or near the campus.

The competitive position of New England in the apple market is studied in relation to market demands and attention is given to export markets and to cities outside of New England. Modern methods of marketing are considered with special reference to developing local markets and to co-operation in handling New England apples.

3 class hours a week. Credits, 3.

Pruning Raspberries

Learning to Spray

Fruit Growing S-7. (Fruit Pests.) II.

Before spraying can be done intelligently, the fruit grower must have an understanding of the life histories of the principal pests for which the spraying is done. This course is concerned with development of insect and disease pests, and particular attention is given to the vulnerable points in their life cycles, at which control measures are directed.
3 class hours a week. Credits, 3.

Fruit Growing S-8. (Spraying.) III.

In this course a careful study is made of modern methods of spraying. All the principal spray materials are studied, and the student is given practice in their preparation for use and in applying them to the orchard.

The department is well equipped with modern spraying apparatus, from bucket pumps to large power outfits, and students are required to study the construction of these pumps, and to operate them in the orchards.

Spraying is very properly regarded as one of the most important operations in connection with growing fruit, and it is the aim of this course to train students to recognize the work of our common orchard pests, to prepare the proper materials for their control, and to apply them efficiently.
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Fruit Growing S-9. (Problems in Orchard Management.) III.

This course provides an opportunity to focus placement training experiences and information acquired in previous courses on the major problems of the New England fruit grower. It is the aim of the course to familiarize the student with conditions under which fruit must be grown here, with current thought on the more important recent developments, and with the sweeping adjustments which are being made in the fruit industry of the Northeastern States.
3 class hours a week. Credits, 3.

Fruit Growing S-10. (General Course in Fruit Growing.) I. II.

This course is intended to meet the needs of students in the Animal Husbandry and Poultry majors who cannot devote more than one term to the subject of Pomology. It deals with the practical side of the growing and marketing of fruits. Special attention is given to such questions as selection of site for plantation, choice of varieties, grafting and budding, spraying, pruning, cultivation and cover crops, fertilizing the fruit plantation, packing and marketing.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Note.—Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

GENERAL HORTICULTURE

The object of this course is to train men for positions as superintendents or foremen on parks or on private estates, or as foremen for landscape gardeners, or for private practice in horticulture service, including so-called tree surgery, city forestry and golf grounds.

Ample classrooms and laboratories with necessary equipment are provided for all work that must necessarily be done indoors. The extensive college campus with its stretches of lawn, its plantings of trees, shrubs, and vines, its drives and walks, furnishes an outdoor laboratory where the student will be brought into personal relation with problems comparable in every way with those that arise in the management of a park, private estate, etc. Work with various types of horse power, motor power and hand machinery and implements will give him practical knowledge of their use, care, and application. A growing nursery furnishes opportunity for the propagation and culture of those plants used in ornamenting grounds, the transplanting of these about the grounds in compliance with prepared landscape plans, and their subsequent care, including proper methods of pruning.

Horticulture

First Year

Fall Term

- Agricultural Opportunities S-1 (Required of women students)
- Business Law S-1
- Horticulture S-1 (Propagation of Plant Materials)
- Horticulture S-10 (Golf Course Maintenance)
- Soils and Crops S-1 (Soil Management)
- Vegetable Gardening S-1 (Principles of Vegetable Growing)
- *Physical Education S-1
- Physical Education S-3 (Hygiene—required of men students)
- Tractor Practice

Electives

- English S-1 (Required of students having less than two years of High School)
- Home Economics S-5 (Home Furnishing)

*Physical Education S-1 is required of men students not participating in football; also required of women students)

Winter Term

- Agricultural Engineering S-2 (Motors)
- Applied Mathematics S-1
- Business Law S-2 (Continuation of Business Law S-1)
- Forestry S-1 (Woodlot Management)
- Horticulture S-2 (Plant Materials)
- Soils and Crops S-2 (Fertilizers)
- Physical Education S-2 (Required of women students)
- Teaming and Harnessing

Electives

- Home Economics S-2 (Foods)
- Physical Education S-4 (Basketball and Hockey)

Spring Term

Six months' placement training.

Second Year

Fall Term

- Bacteriology S-1 (Bacteriology and Rural Hygiene)
- Fruit Growing S-10 (General Course)
- Horticulture S-4 (Principles of Plane Surveying)
- Horticulture S-7 (Park and Estate Maintenance)
- Horticulture S-9 (Golf Course Maintenance)

or

- Fruit Growing S-4 (Small Fruits)
- Physical Education S-2 (Required of men students not participating in football)

Electives

- Physical Education S-3 (For women)

Winter Term

- Fruit Growing S-7 (Fruit Pests)
- Horticulture S-3 (Plant Materials)
- Horticulture S-5 (Drawing and Mapping)
- Horticulture S-12 (Care of Plant Materials)
- Horticulture S-13 (Plant Breeding)
- Rural Sociology S-1 (Social and Economic Problems)

Electives

- Physical Education S-4

Spring Term

- Flower Growing S-7 (Herbaceous Plants and their Uses)
- Fruit Growing S-8 (Spraying)
- Horticulture S-6 (Surveying and Plan Making)
- Horticulture S-8 (Construction and Maintenance)
- Horticulture S-11 (Golf Course Maintenance)
- Rural Sociology S-2 (Continuation of Rural Sociology S-1)

Electives

- English S-3
- Physical Education S-5 (Baseball)

Horticulture S-1. (Propagation of Plant Materials.) I.

This course will present the principles of plant propagation with special reference to their application to plant materials in nursery practice.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Horticulture S-2. (Plant Materials.) II.

The object of this course is to learn to know the trees, shrubs and vines used in ornamental plantings with special consideration of their individual foliage characters.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Horticulture S-3. (Plant Materials.) II, III.

A continuation of Horticulture S-2, giving special consideration to distinguishing characters present in the dormant plants.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Horticulture S-4. (Principles of Plane Surveying.) I.

Outdoor practice in the use of simple surveying instruments, as tapes, com-

passes and levels used in the measurement of land surfaces. Lectures will include explanation of construction and theory of instruments.
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Horticulture S-5. (Drawing and Mapping.) II.

This course deals with practice in elementary drafting, using various types of instruments and materials. Use will be made of the notes taken in Horticulture S-4, in the study of contour maps, grading plans, house lots and gardening problems. Practice will be given in the reading and interpretation of typical maps and plans.
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Horticulture S-6. (Surveying and Plan Making.) III.

In this course there will be an application of the methods studied in Horticulture S-4 and S-5 to the mapping of small areas, house lots, garden and park areas, road and walk construction, staking out areas from plans, grading work and simple garden construction problems.
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Horticulture S-7. (Park and Estate Maintenance.) I.

The work of this term will deal with construction and maintenance of roads and walks, especially such roads as are typical to parks and estates, proper foundations and drainage being emphasized; systems of cost keeping for parks and estates and actual cost records analyzed; relationship between superintendent and laborer; and the entire problem of lawn grass seed, illustrated by growing plots of the more common varieties. Throughout the term there will be laboratory exercises pertinent to the typical fall problems.
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Horticulture S-8. (Construction and Maintenance.) III.

In addition to the routine spring problems special emphasis will be made upon the proper cultural methods for lawn building and maintenance. A careful study of all equipment will be made this term.
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Horticulture S-9. (Golf Course Maintenance.) I.

While this course will not teach golf course designing, the fundamentals of good designs will be carefully studied particularly as they effect maintenance. Fall maintenance problems will be practiced and studied. (The course is designed for those horticulture students who give major consideration to Golf Course Maintenance; others will take Fruit Growing S-4.)
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Horticulture S-10. (Golf Course Maintenance.) I.

The identification of grasses in turf will be required, and the effects of fertilizers on various grasses will be studied. This course is designed to give the fundamentals of turf culture.
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Horticulture S-11. (Golf Course Maintenance.) III.

The students will be required to do experimental work in turf diseases and pest control. Fertilizer results will be further considered and managerial duties studied. A field trip is a part of the required work of this course.
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Horticulture S-12. (Care of Plant Materials.) II.

This course deals with the care of woody ornamental plants under the following heads; planting, pruning, maintenance of soil fertility, winter protection and tree-surgery.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Horticulture S-13. (Plant Breeding.) I, II.

This course considers the origin of cultivated plants, the problems and methods of the plant breeder in the improvement of horticultural varieties, and some of the basic principles of inheritance on whch plant improvement is based.
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Excursions.

For Horticulture S-7, a one-day excursion to estates in Berkshire County. Estimated cost $5.00.

For Horticulture S-11, a two-day excursion to the eastern part of the state visiting golf courses and greenskeepers. Estimated cost $15.00.

These excursions will be required.

Note.—Every student must qualify in tractor practice; and in harnessing and teaming, single and double. Arrangements for practice periods and examinations by special assignment. No student will be put on placement training who has not satisfied these preliminary requirements.

VEGETABLE GARDENING

The business of vegetable growing is one of the leading types of agriculture in Massachusetts. Middlesex County is surpassed in the value of vegetables grown for sale by only four other counties in the United States. The value of vegetables grown for home use in Massachusetts is more per farm than in any other State in this country. The vegetable greenhouse district around Boston is one of the largest in the United States, and the only district growing head lettuce under glass. The Massachusetts markets for vegetables are considered by many to be among the best, for we are further removed from the large vegetable trucking sections than other large centers of population, while our markets demand high-quality vegetables.

The two-year course in Vegetable Gardening is designed to prepare men to go into business for themselves as market gardeners, truck farmers, and greenhouse vegetable growers. For those whose principal interest may lie in other fields of agriculture the course has much to offer along the lines of special crops, often spoken of as cash crops. For those who wish to work for someone else this course offers training such that its graduates are being placed in responsible positions with commercial vegetable growers, seed growers, and on private estates.

The business of vegetable gardening may be undertaken with a limited outlay of capital, for the returns on the capital invested are quickly secured. Some vegetable crops mature in a very few weeks, thus enabling one to turn over his capital from one to three times per season. The nature of this business is such that one locates as near the market as possible, and because of the growth of our cities, vegetable growers, as a group, have profited much by an increase in land values.

The Vegetable Gardening Department has 10 acres of land, 3,500 square feet of greenhouse space, and 500 linear feet of hotbeds and cold frames. These are used to give the student thorough practical training in the fundamentals of vegetable growing, plant production, and vegetable forcing. The office, classroom and laboratory are located in French Hall.

Vegetable Gardening

First Year

Fall Term

- Agricultural Opportunities S-1 (Required of women students)
- Business Law S-1
- Flower Growing S-1 (Garden Flowers and Bedding Plants)
- Fruit Growing S-10 (General Course)
- Soils and Crops S-1 (Soil Management)
- Vegetable Gardening S-1 Principles of Vegetable Growing)
- *Physical Education S-1
- Physical Education S-3 (Hygiene—required of men students)
- Tractor Practice

Electives

- English S-1 (Required of students having less than two years of High School)
- Home Economics S-5 (Home Furnishing)

*Physical Education S-1 is required of men students not participating in football; also required of women students)

Winter Term

- Agricultural Engineering S-4 (Repair of Farm Equipment)
- Agricultural Engineering S-7 (Farm Structures)
- Business Law S-2 (Continuation of Business Law S-1)
- Flower Growing S-2 (Greenhouse Construction and Heating)
- Vegetable Gardening S-2 (Principles of Vegetable Growing)
- Soils and Crops S-2 (Fertilizers)
- Physical Education S-2 (Required of women students)
- Teaming and Harnessing

Electives

- Home Economics S-2 (Foods)
- Physical Education S-4 (Basketball and Hockey)

Spring Term

Six months' placement training.

Second Year

Fall Term

- Agricultural Economics S-1 (Farm Economic Problems)
- Agricultural Engineering S-2 (Motors)
- Beekeeping S-1
- Fruit Growing S-4 (Small Fruits)
- Horticultural Manufactures S-1
- Vegetable Gardening S-3 (Systematic Vegetable Growing)
- Physical Education S-2 (Required of men students not participating in football)

Electives

- Physical Education S-3 (For women)

Winter Term

- Agricultural Economics S-2 (Marketing)
- Business Management S-1 (Fundamentals of Business Management)
- Horticulture S-13 (Plant Breeding)
- Horticultural Manufactures S-2
- Rural Sociology S-1 (Social and Economic Problems)
- Vegetable Gardening S-4 (Vegetable Forcing)

Electives

- Physical Education S-4

Spring Term

- Beekeeping S-2
- Business Management S-2 Continuation of Business Management S-1)
- Fruit Growing S-9 (Problems in Orchard Management)
- Horticultural Manufactures S-3
- Rural Sociology S-2 (Continuation of Rural Sociology S-1)
- Vegetable Gardening S-5 (Control of Insects and Diseases)
- Vegetable Gardening S-7 (Principles of Vegetable Growing)

Electives

- English S-3
- Physical Education S-5 (Baseball)

Vegetable Gardening S-1. (Principles of Vegetable Growing.) I.

Cultural practices employed in the growing of vegetables vary widely from place to place but the fundamental principles underlying these practices are everywhere the same. The lecture work in this course consists of a study of these principles with illustrations of their applications from a theoretical standpoint. The laboratory work consists of a study of the applications of scientific and practical knowledge to vegetable culture.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Vegetable Gardening S-2. (Principles of Vegetable Growing.) II.

The lecture work in this course is a continuation of that in Vegetable Gardening S-1. The laboratory work consists of a series of experiments on plant behavior. Problems on water requirements, plant nutrition, and the effects of various other factors on crop growth and yield are studied at first hand.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Vegetable Gardening S-3. (Systematic Vegetable Gardening.) I.

This course is designed to acquaint the student with the identification, nomenclature and classification of the standard types and varieties of vegetables; seed production and variety improvement work; sources of obtaining seed; exhibiting and judging of vegetables.
2 class hours and 2 2-hour laboratory periods a week. Credits, 4.

Vegetable Gardening S-4. (Vegetable Forcing.) II.

A study of (1) the geographical distribution of the greenhouse industry, and the part this phase of vegetable production plays in supplying our markets with fresh vegetables; (2) the underlying principles of plant production under glass and their practical applications; (3) economic factors in harvesting and marketing of greenhouse produce.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Vegetable Gardening S-5. (Control of Insects and Diseases.) III.

This course is intended to give the students majoring in vegetable gardening an understanding of the most common insects and diseases which attack vegetable plants and the most satisfactory methods for controlling these pests.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Vegetable Gardening S-6. (Principles of Vegetable Growing.) III.

This course is similar to course S-1 except that it is more comprehensive. The practical studies are limited chiefly to the crops with which this group of students is likely to have to deal.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Vegetable Gardening S-7. (Principles of Vegetable Growing.) III.

A knowledge of the principles underlying the commercial vegetable growers' problems is necessary before these problems may be satisfactorily solved. Weekly assignments dealing with specific problems as encountered in the vegetable growing business are worked out by the students. Organized trips through the Connecticut Valley and one trip through the market gardening section near Boston are required. This latter trip requires about three days and costs each student approximately fifteen dollars.
2 class hours and 1 2-hour outside laboratory period a week. Credits, 3.

RELATED SUBJECTS IN OTHER DEPARTMENTS

Farm Economics and Marketing

Instruction in agricultural economics is given with a view toward presenting the business side of economics of agriculture. The required course is divided into two parts given in separate terms. The approximate division of subject matter for each term is indicated below.

Agricultural Economics S-1. (Farm Economics Problems.) I.

The purpose of this course is to introduce students to the more important economic problems facing New England farmers. Increasing competition with other farm sections, long-time movements of farm prices and farm profits, farm credit, farm taxation, tariffs and other farm relief measures are some of the problems to be considered.
(See requirement for marketing trip below.)
3 class hours a week. Credits, 3.

Agricultural Economics S-2. (Marketing.) II.

This course deals largely with economic problems arising out of marketing farm products. Particular attention is given to marketing methods used in New England and to the comparison of local methods with methods used by farmers in competing sections. Principles and methods of co-operative marketing used by successful co-operative associations are studied in detail in order to show how New England farmers may meet competition from associations in other sections, either as individual producers or as officers or members of local associations.

A two-day marketing trip to Boston or New York is required of all students in order to study at first hand the methods of handling products on the wholesale markets. This trip may be required in either term.

3 class hours a week. Credits, 3.

Agricultural Engineering S-1. (Farm Engineering.) I.

This course is intended to familiarize the student with the various types of farm implements, to teach him their operation and care, and give practice in the adjustment and repair of the mechanical equipment on the farm.

The various types of field implements are studied, and emphasis is laid on the selection of implements suited to New England conditions. The adjustment of machines is discussed and the student is given practice in setting machines for different field conditions.

Part of the course is given over to the repair of farm equipment. In this work part of the time is given over to blacksmithing and the balance to such exercise as soldering, babbitting and fitting bearings, lining up shafting, pipe fitting, threading bolts and nuts, and practice in tying knots and splicing rope. Farm implements are brought in and overhauled to give practical work in this line. In the limited time available it is not expected to make a blacksmith or mechanic out of the student, but it is hoped that the student will learn to know the tools used and get sufficient practice in their use so that he can make repairs on his own equipment.

Part of the course is given over to the study of water supply systems, including pumps, rams, and complete power systems. Farm-lighting plants are also studied, attention being given to selection, as well as care and operation. The principles underlying the practice of farm drainage are discussed, and practice is given in the use of simple leveling instruments for the purpose of accurately grading tile drainage ditches.

2 lectures and 3 2-hour laboratory periods a week. Credits, 5.

Agricultural Engineering S-2. (Farm Motors.) I, II.

This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles and tractors. Special attention is given to overhauling and repairing.

3 2-hour laboratory periods a week. Credits, 3.

Agricultural Engineering S-3. (Carpentry.) I.

This course gives practice in the care and use of carpenters' tools through bench work, repair of farm equipment, and building construction. Small buildings are erected by the students to give practice in all the phases of house construction. Practice is given in the building of forms and in the mixing and placing of concrete. (Must be taken with Agricultural Engineering S-7.)

2 2-hour laboratory periods a week. Credits, 2.

Agricultural Engineering S-4. (Repair of Farm Equipment.) II.

The object of this course is to give practice in the handling of tools, which will help in the repair of farm machines and miscellaneous farm equipment. Practice is given in forging, including drawing and shaping iron and steel, welding and tempering edged tools, and general blacksmith's repairing. Exercises also include pipe fitting, soldering, splicing rope, belt lacing, and babbitting and adjusting bearings. Practice is given in the use of machinists' tools, such as cold chisel, file, taps and dies, drill press, and lathe. (Must be taken with Agricultural Engineering S-7.)

2 2-hour laboratory periods a week. Credits, 2.

Agricultural Engineering S-5. (Dairy Mechanics.) III.

This course is planned for men who are fitting themselves to take charge of dairy plants or allied lines of work. A study of steam boilers, steam engines, steam turbines, pumps, steam traps, line shafts, belting, electric motors, milking machines, and refrigeration plants.
3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

Agricultural Engineering S-7. (Farm Structures.) I, II.

A study of the building materials commonly used in farm construction; details of construction and simple structural mechanics; the principle of design of such farm buildings as the dairy stable, hog house, horse barn, general purpose barn, poultry house, fruit and vegetable storage buildings, etc.

In the drafting room practice will be given in the use of drawing instruments, and instruction given in the fundamentals of drawing. Each student will have opportunity to design in complete detail one of the major farm buildings in which he is particularly interested. (Must be taken with Agricultural Engineering S-3 or S-4.)
1 class hour and 2 2-hour laboratory periods a week. Credits, 3.

Agricultural Opportunities for Women S-1. I.

An outline of the occupational progress of women with special attention to the vocational opportunities for women in agriculture and related fields.
2 class hours a week. Credits, 2.

Applied Mathematics S-1. II.

A careful study of fractions, decimals, percentage, ratio and proportions, powers, roots, denominate numbers and elementary mensuration. Especial attention will be given to methods of computation and to practical applications to work given in the Horticultural Department.
5 class hours a week. Credits, 5.

Bacteriology S-1. (Bacteriology and Rural Hygiene.) I.

In this course bacteria are studied as to types and reproduction, together with methods of dissemination, followed by discussions on these micro-organisms as related to man and his environment.

The work of the course will be divided into sections having to do with the study of the sanitary production and handling of milk, water and food and into a section having to do with the study of bacteria in terms of diseases of man and animal and the relationship to environmental factors such as air, humidity, food and personal hygiene. The sanitary production and distribution of milk is an important problem to a community and under the discussions pertaining to milk are to be considered various avenues of infections, methods of maintaining a sanitary production and how to establish suitable means for checking anything pertaining to contamination. Since water supplies are of special importance to man the construction of wells, cisterns, etc. will be considered briefly followed by discussions relative to contaminations and their consequences. The proper disposal of sewage offers a rural problem of no small importance. Therefore, in this course will be discussed construction and installation of septic tanks, together with the study of some of the bacteriological work to establish their efficiency. Work has been planned in this course to present some of the problems pertaining to the production and distribution of foods, special attention being given to preservation methods.

In the latter part of this course will be presented some problems associated with the disease of man and animal. Various disinfectants will be considered and some time will be devoted to a discussion on the use and preparation of serums for fighting disease.

The purpose of this course will be to acquaint the student with the importance of bacteria and the subject of bacteriology in agriculture, industry, the arts and the relationship of this subject to the health of man and animals.

3 class hours a week. (Poultry and Dairy Manufactures majors.) Credits, 3.
1 class hour a week. (Animal Husbandry majors.) Credit, 1.
5 class hours a week. (General Horticulture majors.) Credits, 5.

Bacteriology S-2. (Bacteriology and Rural Hygiene.) II.

This course is a continuation of Bacteriology S-1 and is required of students taking that course.
3 class hours a week. (Poultry and Dairy Manufactures majors.) Credits, 3.
5 class hours a week. (Animal Husbandry majors.) Credits, 5.

Bacteriology S-3. (Dairy Bacteriology.) I.

Bacteria and other micro-organisms are the responsible agents for changes which occur in milk, and for the contagion which sometimes causes disease. They are found in milk at times when leaving the udder, they get in with the dust and dirt while milking and they adhere to the dairy utensils which carry them over from one milking to the next. From the cow to the consumer there is the constant presence of these micro-organisms to contend with, on the one hand, and to foster on the other.

Many of these changes occurring in milk are undesirable, such as ropy milk, sour milk, bitter milk, tainted milk, etc. Many of these changes are encouraged as the ripening of cream for butter, of milk for cheese, of milks for milk drinks. The former are fought, the latter fostered.

Micro-organisms of typhoid fever, scarlet fever, diphtheria and other diseases find their way by means of milk to the consumer and produce epidemic forms of these diseases.

Much time is spent in making plate counts and interpreting results. The different bacteriological tests are studied, such as Breed and Methylene Blue. The proper use of these methods will quickly enable one to locate the source of trouble and check any further continuance.

It is evident therefore, that to handle milk and milk products safely it is desirable to know something of the agents which are the source of so much attention in the dairy. This indicates the nature of the substance of this course. This course is required of all students who elect dairying as one of their special lines of work.
1 4-hour and 2 3-hour laboratory periods a week. Credits, 5.

Beekeeping S-1. I.

This course and the one following comprise a general consideration of the biology of the honey bee and the elements of practical beekeeping. This includes the life history of the individuals and their relation to the colony, their structure, normal behavior and instincts which form the basis of practical beekeeping. The best methods of management, which will provide more productive colonies for greenhouse and orchard pollination, and honey production are studied. Consideration is given to the problems of marketing and control of bee disease. As far as possible, the work is made individual in the construction of equipment and manipulation of bees.

The problems of fall management and wintering are made the basis of this course while those concerning spring and summer management are covered in Beekeeping S-2.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Beekeeping S-2. (Beekeeping.) III.

This course is a continuation of Beekeeping S-1 and is required of students taking that course.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Business Law S-1. I.

Required for freshmen. To consist of a particular study of the contract, drawing, reading and interpretation with specific problem work. Commercial paper, torts, equity and personal rights presented by lectures during the course. Particular stress is placed on the reasoning process.
3 class hours a week. Credits, 3.

Business Law S-2. II.

Required for freshmen. Being a continuation of S-1 and dealing specifically with Sales, Agency, Master and Servant. Corporations, associations, and partnerships presented incidentally by lectures.
3 class hours a week. Credits, 3.

English Composition S-1. I.

Required for freshmen with less than two full years of high school preparation, or its equivalent; and elective for others. To consist of directed readings (one book or its equivalent per week); essay writing (one short essay, book report personal or business letter, or writing of a similar nature per week); and an oral presentation (a five minute address or talk on an assigned topic to be prepared for each week, and as many heard as time permits).
3 hours a week. Credits, 3.

English Composition S-3. III.

Required of seniors interested in dramatic presentation and elective for the rest. This course is in continuation of the freshman course; but lays particular stress on the drama and dramatic presentation. (All dramatic presentation endeavored by the Two-Year Course, or other short courses to be under the direction of the instructor in English Composition.)
3 hours a week. Credits, 3.

Farm Management S-1. (Farm Management and Accounts.) I, II.

The work in this course involves a study of farm records and accounts; cost of producing and prices of farm products; uses of capital and credit; types of farming, selection of crop and livestock enterprises; size, diversity and production as related to the successful farm business; farm layout and arrangement; economic use of labor, power and equipment; detailed analyses of both successful and unsuccessful farms, how the farmer should make adjustments to meet economic changes; and finally, a bringing together of the information gained and applying it to the successful organization of a farm business.

Actual farm records are used to illustrate the above points. The entire course is made as applicable and practical as possible. Farm experience and the keeping of a personal expense account during the period of placement training are prerequisites of this course.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Farm Management S-2. (Farm Management and Accounts.) II, III.

This course is a continuation of Farm Management S-1 and is required of students taking that course.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Note.—Farm Management S-1 and S-2 are given in the fall and winter terms for students majoring in Dairy Manufactures and Animal Husbandry; in the winter and spring terms for students majoring in Poultry Raising and Fruit Growing.

Business Management S-1. II.

This course is designed primarily for students majoring in Flower Growing and Vegetable Gardening. It involves a study of records and accounts used by florists and vegetable growers; costs and prices; uses of capital and credit; house and store management; advertising; buying and selling; economic use of labor and equipment; general business trends as affecting the flower and vegetable business; how the florist and vegetable grower should make adjustments to meet economic changes; analyses of going concerns; and finally a bringing together of all the information studied and applying it to the successful organization of a business. The entire course is to be made as applicable and practical as possible.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Business Management S-2. III.

A continuation of Business Management S-1 and is required of students taking that course.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Forestry S-1. (Woodlot Management.) II.

A course in tending, harvesting, marketing, and renewing the forest crop, with particular reference to the problems of the farm woodlot. The instruction is mainly practical, and is conducted in the field, with a minimum of bookwork; but there is a constant emphasis upon the development of keen and imaginative observation, and the acquisition of the conservationist point of view. Opportunities for field work are varied and extensive. There are woodlots of several types on or near the campus, and students have the fullest use of the Mt. Toby Demonstration Forest, a 750-acre tract 7 miles distant, belonging to the college and managed by the Forestry Department.
2 class hours and 1 4-hour and 1 2-hour field period a week. Credits, 5.

Home Economics S-1. (Clothing.) I.

This course is based on the need of good judgment in the selection of clothing, both ready made and home made. It includes a study of fabrics, their cost, value, manufacture and suitable use; of ready-made and homemade garments; and of design, color and general appropriateness and becomingness of clothing. Some garments are made in the laboratory.

Estimated cost of materials used in laboratory $5.00-$10.00. (Offered in 1930-31.)
3-5 class hours a week. Credits, 3-5.

Home Economics S-2. (Foods.) II.

This course aims to teach wise food selection and methods of preparation which are attractive, but which conserve food values. The use of a few basic principles in food preparation and serving, and in meeting nutritional needs will be stressed. Special study will be made of the body needs of persons of different ages and activity, and of the choosing of foods to meet these needs.
3-5 class hours a week. Credits, 3-5.

Home Economics S-3. (Health and Home Nursing.) III.

In this course emphasis is placed upon personal hygiene as a means of maintaining and improving health in the home. This will include ways of living to prevent sickness, the care of the family in case of unavoidable sickness, and the right attitudes toward health. (Offered in 1930-31.)
3 class hours a week. Credits, 3.

Home Economics S-4. (Home Management.) II.

This course includes a study of the organizing and simplifying of methods of housekeeping; standards of living and family expenditures; the use of leisure time; family and community relationships. (Offered in 1930-31.)
3-5 class hours a week. Credits, 3-5.

Home Economics S-5. (Home Furnishing.) I.

This course emphasizes the importance of attractive surroundings in creating a happy home life. It aims to develop good judgment and right standards in the selection of home furnishings. The discussions include the basic principles of good design, the use of color, the treatment of walls, floors and windows, and the choice, cost and arangement of all types of furnishings found in the average home.
3-5 class hours a week. Credits, 3-5.

Horticultural Manufactures S-1. I.

The utilization of culls and low grades of fruits and vegetables is becoming a more important problem each year. Producers should be able to market their whole crop at a profit. The general problems studied in this course will be: the manufacture of apple products from cull apples; the canning of all fruits and vegetables available at this season, together with the manufacture of their various products, such as jams, jellies, conserves, pickles, etc.

Students will be required to keep accurate costs of materials in all canning and manufacturing operations together with a record of methods used.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

Horticultural Manufactures S-2. II.

This is a continuation of Course S-1. The preservation of small fruits together with the manufacture of their products; the evaporation of fruits and vegetables, and the manufacture of fruit syrups are the principal subjects studied. Prerequisite: Horticultural Manufactures S-1.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

Horticultural Manufactures S-3. III.

This is a continuation of Horticultural Manufactures S-1 and S-2. The manufacture of maple products, fermented pickles, and the canning of spring vegetables will be the principal subjects studied. Students will be given opportunity to make special studies along the lines of their greatest interest. Prerequisites: Horticultural Manufactures S-1 and S-2.

1 class hour and 2 2-hour laboratory periods per week. Credits, 3.

Rural Sociology S-1. II.

Required for seniors. A study of the individual and his relationships and conflicts in society, particular note to be taken of rural society and its problems. Individual topics assigned and papers prepared.

3 class hours a week. Credits, 3.

Rural Sociology S-2. III.

Required for seniors. Specific problem study, individual topics assigned and papers prepared and discussed in class. Rural religion, 4-H Club work, extension service and experiment station work and their significance in the farm problem to be presented by specialists in the field.

2 class hours a week. Credits, 2.

Soils and Crops S-1. (Soil Management.) I.

Every agricultural interest is vitally concerned with the soil, its adaptations and its management for plant production. This course treats of the selection of suitable soils for the special purposes of agriculture, horticulture and floriculture, and with the management of soils with regard to moisture control, tillage, organic matter, soil bacteria, and soil acidity.

The laboratory work gives training in the use and interpretation of the maps of the U. S. Soil Survey and in tests of soil texture, organic matter and acidity. Practical field work will be given in judging the crop adaptation and value of soils, and field demonstration of the use of tillage tools on the college farm.

As a field project the student will be required to make a study of some farm, nursery or florist's plant. This project includes a survey of the soil conditions, and methods of soil and crop management, with analysis of the relation of the soil to the enterprise as a whole.

2 class hours and 1 3-hour laboratory period a week. Credits, 3.

Soils and Crops S-2. (Fertilizers.) II.

This course deals with the storage and handling of manure and its use in crop production, with the selection and use of lime materials, and with the economical purchase and use of commercial fertilizers. The interpretation of fertilizer analysis and guarantee will be studied. Special attention will be given to the newer concentrated fertilizer materials and to those produced from atmospheric nitrogen.

The laboratory work will give practice in identification of fertilizer materials, and in the calculation of fertilizer formulas, and preparation of fertilizer mixtures. A demonstration of the effect of the different fertilizer elements on plant growth will be carried out by the students in the department greenhouse.
2 class hours and 1 2-hour laboratory period a week. Credits, 3.

Soils and Crops S-3. (Field Crops.) III.

This course is planned to acquaint the student with the best and most successful practices of production and harvesting of field crops. Problems usually arising in connection with these practices will be studied. Special attention will be given to the hay crop, corn, potatoes, roots, and pastures. Field work with growing crops and laboratory work in the identification of seeds of grasses, clovers, weeds and small grains, in tests of purity and germination of seeds and judging of different types of corn and potatoes will be given. Before completing the course the student will be expected to know how to select varieties, test seed, prepare the soil, select and apply fertilizer, plant, cultivate, harvest and store the field crops important in Massachusetts.
2 class hours, and 3 2-hour laboratory periods. Credits, 5.

Veterinary Science S-1. (Animal Sanitary Science.) III.

Conservation of the health of animals is the keystone of successful animal husbandry. This course acquaints students with the essentials upon which the health of animals depends. In order that students may later guard the animals in their charge, attention is given to conditions favoring communicable and noncommunicable diseases, and to prophylactic measures.
5 class hours a week. Credits, 5.

PHYSICAL EDUCATION

Women

All women students are required to take phyiscal education throughout the first year and may elect it with credit during the first and second terms of the last year.

Undergraduate women students are required to furnish a physical examination report from their family physician.

Physical Education S-1. I.

This course will include such outdoor sports as soccer, basketball, tennis and hiking.
2 class hours a week. Credits, 2.
Mrs. Hicks.

Physical Education S-2. II.

This course will include posture exercises, folk dances, and games.
2 class hours a week. Credits, 2.
Mrs. Hicks.

Physical Education S-3 and S-4. I-II. (Elective for seniors.) Credits, 2.
Mrs. Hicks.

Men

Required Courses

Physical Education S-1. I. Recreation.—For freshmen. Outdoor games.

The following outdoor games are taken up: Soccer, touch football, kick, and cricket. Men may elect football, golf, tennis, and track. The course aims to give every man the opportunity to develop sufficient control over his body to enable him to get pleasure from physical activities and to establish correct health habits.
2 laboratory hours a week. Credits, 2.

Physical Education S-2. I. Recreation.—For seniors. Outdoor games.

Includes the games of playground ball, speedball, and volley ball with the object of giving the men a fund of exercise material for use in after school days. Men may elect football, golf, tennis, and track.
2 laboratory hours a week. Credits, 2.

Physical Education S-3. I. Hygiene.—For freshmen.

Lectures on personal hygiene including the physiological basis for sound health habits, the importance of the systematic planning of a student's daily program in order to provide the proper amounts of time for study with suitable periods of sleep, relaxation, recreation and sports; posture, appropriate types of exercise, proper nutrition, social adjustment, the necessity for frequent medical, optical and dental advice, sanitation and group health requirements.
1 class hour a week. Credit, 1.

Elective Courses

Physical Education S-4. II. Recreation.—For freshmen and seniors. Basketball and Hockey.

Students electing this course must report regularly for the basketball and hockey squads. Credits, 2.

Physical Education S-5. III. Recreation.—For seniors. Baseball.

Students electing this course must report regularly for the baseball squad. Credits, 2.

SHORT COURSES AT THE MASSACHUSETTS AGRICULTURAL COLLEGE

Short courses are based on the idea that the motive which inspires study is the most significant factor in study itself, and that this motive rises when the student himself realizes he faces a problem that calls for a solution. Therefore, there is no age limit. Enrolled in short courses are found the young and the old, the experienced and the inexperienced, the theoretical and the practical. In this grouping there is a value, since students learn from each other as well as from the instructors. Practically all Short Course students intend to make a direct application of the knowledge given. Hence the aim of Short Course work is to offer the largest amount of information and training in agricultural and horticultural lines in the shortest possible time. During the past twenty years Short Courses have served hundreds of students in this Commonwealth, and the demand for these courses in recent years has steadily continued.

THE SUMMER SCHOOL

The college has maintained a Summer School for the past twenty-one years. The Summer Course is intended for high school teachers, teachers of agriculture, instructors in home economics, and for students who wish courses in science, education, and horticulture. The course lasts six weeks, beginning about the first of July and continuing through the month to about the second week in August. All courses offered, if successfully completed, carry collegiate credit or graduate credit.

The following schedule of courses, offered in 1929, indicates the nature of the work:—

Principals and Methods of Teaching
History of the Philosophy and Practice in Education
Educational Psychology
Secondary Education
Special Methods in Teaching Vocational Agriculture
Tests and Measurements
The Employed Teacher of Agriculture
Vocational Education
Clothing
Home Management Problems
Child Care and Training
Teaching Home Economics
Advanced Entomology
Fresh Water Algae, Fungi, Liverworts, Mosses and Ferns
Public Health
Physiological Chemistry
Garden Flowers and Bedding Plants
Plant Materials
College Algebra
American Literature
Dramatic Presentation
Ibsen and the Contemporary Drama

THE TEN WEEKS' WINTER SCHOOL

The Winter School has been established for a number of years at the college, and has proved to be very popular with farmers, their wives, sons, and daughters, teachers, college graduates, and others. This school begins about the first of January. Courses to be offered in 1930:—

- Soil Fertility
- Field Crops
- Types and Breeds of Live Stock
- Live Stock Feeding
- Animal Breeding
- Farm Management
- Farm Accounts
- Farm Motors
- Dairy Bacteriology
- Animal Diseases
- Vegetable Gardening
- Poultry Raising Courses:—
  - Incubation, Brooding and Marketing
  - Feeding and Culling
  - Poultry Breeding and Sanitation
  - Poultry Housing, Management and Farm Organization
- Fruit Growing Courses:—
  - Tree Fruits
  - Pruning Tree Fruits
  - Spraying
  - Small Fruits
  - Harvesting and Marketing
- Greenskeepers Course
- Practical and Scientific Course for Florists
- Horticultural Manufactures
- Marketing Farm Products
- Botany
- Entomology
- Rural Sanitary Science and Hygiene
- Agricultural Opportunities for Women
- Food and Nutrition
- Textiles and Clothing
- Health Education
- Home Management
- Dairying
- Principles and Methods of Teaching
- Special Methods in Vocational Agricultural Teaching
- Agricultural Teaching Improvement Problems in Massachusetts

A series of special two-week courses in ice-cream making, butter making, milk testing, and market milk are offered. During the two weeks the student devotes all of his time to the work of the special course in which he has enrolled. The instruction lasts throughout the day from 8 to 5. These courses meet a very definite need in the State for those who wish instruction, but who cannot attend for a longer period of time, and who do not wish to take other subjects.

DIRECTORY OF INFORMATION

A. The College.

Those desiring college catalogues, the President's annual report, and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, should address Robert A. Hawley, Secretary, Amherst, Mass.

All questions regarding admission to the college, either to the freshman class or to advanced standing, should be addressed to William L. Machmer, Dean of the College, Amherst, Mass.

B. Experiment Station.

The Experiment Station conducts investigations in as many lines of agricultural science and practices as its funds will permit. It has charge of the inspection of commercial fertilizers, commercial feeding stuffs, and milk-testing apparatus. Branch stations in cranberry and market-garden culture are maintained in other sections of the State.

The station considers the farmers' problems to be its problems, and desires to keep in touch with them.

Requests for bulletins reporting the results of experiments and inspections, and for other information on the work of the station, should be addressed to Fred J. Sievers, Director of the Experiment Station, Amherst, Mass.

C. The Graduate School.

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Dr. Henry T. Fernald, Director of the Graduate School, Amherst, Mass.

D. The Extension Service.

Inquiries of a general nature regarding the work of the Extension Service, extension publications, or requests for new lines of work should be addressed to Willard A. Munson, Director of Extension Service, Amherst, Mass.

E. Short Courses.

For information concerning the Short Courses, the Stockbridge School of Agriculture, the Ten-Weeks Winter School, the Summer School, write or apply to Roland H. Verbeck, Director of Short Courses, Amherst, Mass.